MINNICH

MV-KELLY TESTING UNIT
OPERATOR/SERVICE MANUAL



MINNICH MANUFACTURING

1444 ST RT 42
Mansfield,OH 44903

CONTACT

Phone: (419)-903-0010
Email: sales@minnich-mfg.com

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NOTICE

It is Minnich's policy to constantly strive to improve our products. The information, specifications, and illustrations in this publication are based on the information in effect at the same time as approval for printing and publishing. Minnich therefore reserves the right to make changes in design and improvements whenever it is believed the efficiency of the machine which has been shipped or curring any obligation to incorporate such improvements in any machine which has been shipped or is in service. It is recommended that users contact Minnich or a Minnich Dealer for latest revisions.

NOTICE

See engine manual for information pertaining to the engine.

NOTICE

If there are any questions regarding the machine or its application which are not covered in this manual or in other literature accompanying this unit, please contact your Minnich Dealer or Minnich Manufacturing at 419-903-0010 or sales@minnich-mfg.com

NOTICE

Δ DO NOT adjust the speed in Custom Speed settings, This is set at the correct testing speed from the factory (4,000VPM).

NOTICE

Δ Make sure that the string pot cable is free from debris at all times. Clean it off after every test to ensure proper testing results.

⚠ WARNING

CALIFORNIA PROPOSITION 65

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the Sate of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

Lead from lead-based paints.
Crystalline silica from bricks.
Arsenic and chromium from chemically treated lumbar.

Your risk from these exposures caries, depending on how often you do this type of work. To reduce your exposure to these chemicals: ALWAYS work in a well ventilated area, and work with improved safety equipment, such as dust masks that are specifically designed to filter out microscopic particles.

⚠ WARNING



SILICOSIS WARNING
Grinding/cutting/drilling of masonry, concrete,-metal and other materials with silica in their composition may give off dust or mist containing crystalline silica.
Silica is a basic components of sand, quarts, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respirator disease, including silicosis. In addition, California and some authorities have listed repairable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

⚠ WARNING

RESPIRATORY HAZARDS



Grinding/cutting/drilling of masonry, concrete,metal and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproduction harm, if you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufactures of suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mist and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by OSHA/NIOSH for the materials being used.

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.

This operation manual has been developed to provide complete instruction for the safe and efficient operation. Refer to the engine manufactures instructions for data relative to its safe operation. Before using, ensure that the operating individual has read and understood all instructions in the manual. The surrounding environment and you, could be damaged if you do not follow instructions.

SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: DANGER, WARNING, CAUTION or NOTICE.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, WILL result in DEATH or SERIOUS INJURY

⚠ WARNING

Indicates a hazardous situation which, if not avoided, COULD result in DEATH or SERIOUS INJURY

⚠ CAUTION

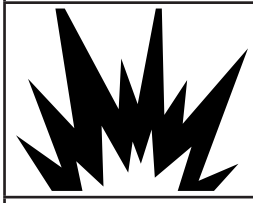
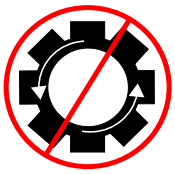
Indicates a hazardous situation which, if not avoided, COULD result in MINOR or MODERATE INJURY

NOTICE

Addresses practices not related to personal injury

SAFETY SYMBOLS

Potential hazards associated with the operation of this equipment will be referenced with hazards symbols which may appear throughout this manual in conjunction with safety messages.

SYMBOL	SAFETY HAZARD
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazard
	Factory Settings

⚠ WARNING

DO NOT USE TOOL IF IT IS IN NEED OF SERVICE!

⚠ CAUTION

Δ NEVER operate this equipment without proper protective clothing, shatter proof glasses, respirator protection, hearing protection, steel-toes boots and other protective devises required by the job or city and sate regulations.



Δ Never operate this equipment when not feeling well due to fatigue, illness or when under medication.



Δ NEVER operate this equipment under the influence of drugs or alcohol.



Δ ALWAYS check the equipment for loosened threads or bolts before starting.

Δ NEVER operate around corrosive chemicals or water containing toxic substances. These fluids could create serious health and environmental hazards. Contact local authorities for assistance.

Δ DO NOT use the equipment for any purpose other than its intended purpose or applications.

NOTICE

Δ This equipment should only be operated by trained and qualified personnel 18 years of age and older.

Δ This equipment is for industrial use only. Whenever necessary, replace nameplate, operation and safety decals when they become difficult to read.

Δ Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modifications will void all warranties. Any modification which it could lead to change in the original characteristics of the machine should be made only by the manufacturer who shall confirm that the machine is in comfortability with appropriate safety regulations.

Δ Never use accessories or attachments that are not recommended by Minnich for the equipment. Damage to the equipment and/or injury to user may result.

Δ Always know the location of the nearest fire extinguisher.



Δ ALWAYS know the location of the nearest first aid kit.

Δ ALWAYS know the location of the nearest phone or keep a phone on the job site. Also, know the phone numbers of the nearest ambulance, doctor and fire department. This information will be invaluable in the case of an emergency.



⚠ DANGER

Δ NEVER operate the equipment in an explosive atmosphere, near combustible materials, or near flammable or low flash point fluids. An explosion or fire could result causing severe bodily harm or even death.



⚠ WARNING

Δ NEVER disconnect any emergency or safety devices. These devises are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these will void all warranties.

Δ NEVER operate equipment with the covers or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury. Wear clothing that will not likely become caught in the equipment or snag on any moving parts.

⚠ CAUTION

Δ ALWAYS be sure the operator is familiar with the proper safety precautions and operating techniques before using.

Δ NEVER leave the machine unattended. Turn off when unattended

- Δ DO NOT expose vibrator to rain.
- Δ DO NOT use vibrator motor in damp or wet locations without proper electrical circuits.
- Δ DO NOT immerse the motor part in concrete.
- Δ ALWAYS keep clear of rotating or moving parts while operating.
- Δ NEVER leave the machine unattended while running
- Δ ALWAYS disconnect the motor from the power source when not in use, before servicing, and when changing flexible shafting and vibrator heads.

- Δ Allow the machine to cool before servicing. Contact with hot components can cause serious burns.



- Δ Before Each use, ALWAYS check the motor to make certain that there are no damaged parts and that all parts function properly. If any damage or malfunctioning parts are found, have them repaired or replaced by an authorized service facility.

NOTICE

- Δ ALWAYS secure forms. Make sure the form work is well made and braced to withstand the stresses made by vibration.
- Δ ALWAYS keep vibrator motor clean for better and safer operation.
- Δ ALWAYS store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of reach of children and unauthorized personnel.
- Δ Use only factory authorized replacement parts.
- Δ Store idle vibrator motor. When not in use, motor should be stored in a dry, safe storage area.

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

- Δ DO NOT pour waste or oil directly into the ground, down a drain or into any water source.
- Δ Contact you country department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.



- Δ When the life cycle of this equipment is over, remove battery (if equip) and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- Δ When the life cycle of this equipment is over, it is recommended that the unit frame and all other metal parts be sent to a recycling center.

  Metal recycling involves the collection of metal from discarded products and its trans formation into raw materials to use in many Manufacturing a new product.

  Recyclers and manufactures alike promote the process of recycling center promotes energy cost savings.

NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below.

- Δ ALWAYS observe all applicable compulsory regulations relevant to environmental protection, especially fuel storage, the handling of hazardous substances, and the wearing of protective clothing and equipment. Instruct the user as a necessary, or, as the user, request this information and training.

- Δ ALWAYS Dispose of hazardous waste properly. Examples of potentially hazardous waste include used motor oil, fuel, and fuel filters.
- Δ DO NOT use food or plastic containers to dispose hazardous waste.
- Δ DO NOT pour waste or oil directly onto the ground, down or drain or into any waste source.

NOTICE

- Δ ALWAYS keep the machine in proper running condition.
- Δ ALWAYS become familiar with the components of the machine before operation.
- Δ Fix damage to machine and replace any broken parts immediately.
- Δ ALWAYS store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.
- Δ NEVER lubricate components or attempt service on a running machine

⚠ CAUTION

- Δ NEVER tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result in operation in speed ranges above the maximum allowability.



BEFORE CONNECTING THE AIR COMPRESSOR:

⚠ CAUTION

- Δ Install the drill steel and bits into the drill motors and close the latch retainers and rod guides.
- Δ Make sure that the air compressor is set at an operating pressure of not more than 120 PSIG (8Bar)
- Δ Make sure air line is cleaned out and is of the proper size and pressure rating for the drill unit.
- Δ Make sure the lubricator is filled with proper lubricant. See Minnich recommended lubricant below.
- Δ Make sure all controls are in the "off" position and the lift lever (if so equipped) is in the "up" position.
- Δ Make sure all lock pins are in their locked position.

⚠ WARNING

- Δ NEVER attempt to loosen any compressed air hose that is pressurized.
- Δ KEEP AWAY from all hot or spark generating objects, do not smoke when handling fuel.
- Δ So as to facilitate shipment, new or repaired units are not lubricated before delivery to customers.
- Δ DO NOT use hydrocarbons and especially do not use fuel oil for lubricating purposes.
- Δ DO NOT OPERATE MACHINE WITHOUT GUARDS AND COVERS IN PLACE
- Δ ALWAYS disconnect the air supply before changing steel or dismantling the tool for service or repair. For maximum safety we advise the installation of a shut-off valve at the end of the air line.
- Δ NEVER operate the engine with heat shields or guards removed.
- Δ DO NOT remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the engine crankcase and severely scald any persons in the general area of the machine.



NOTICE

- Δ CLEAR AIR SUPPLY LINE: Before connecting vibrator, clear the compressed air supply line of possible impurities, contaminants and water.
- Δ LUBRICATE: Every day or every four hours of continuous service, pour a ½ teaspoon of non-detergent oil into the quick release coupling. NOTE: An optional oiler/strainer is available.

CONNECT/START

NOTICE

If the vibration intensity drops, check that the filters are not clogged or that hoses are not kinked.

STORAGE

NOTICE

To properly store unit after use, hang the vibrator with the head up and set the handle (variable control assembly) in the open position to permit the discharge of possible impurities, contaminants and water.

PLACEMENT AND CONSOLIDATION

NOTICE

The force exerted by an internal concrete vibrator is controlled by the weight and the speed at which the eccentric rotates. The centrifugal force exerted can be arrived at by various combinations of weight (size of eccentric weight) and the speed at which the weight rotates. For years the most favorable working speed for a vibrator was considered to be around 10,200 RPM (VPM) and consequently this figure is used in many vibrator comparisons. More recently, the optimum speed for compaction has been accepted as being between 7500 and 9000 RPM.

PERSONAL SAFETY

- Δ Stay alert, watch what you are doing, and use common sense when operating the machine.
- Δ DO NOT use the tool while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury or death.
- Δ Dress properly. DO NOT wear loose clothing or jewelry. Tie up long hair. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelery, or long hair can be caught in moving parts.
- Δ DO NOT overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control in unexpected situations.

SERVICE

- Δ Tool service must be preformed only by qualified repair personnel. Service or maintained preformed by unqualified personnel could result in injury or death
- Δ When servicing a tool, use only identical replacement parts. Use of unauthorized parts may create a risk of injury or death.

NOTICE

To find the latest revision of this publication, visit our website at: www.minnich-mfg.com

NOTICE

THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

NOTICE

Specifications and part numbers are subject to change without notice.

SYMBOL DEFINITIONS

V Volts
A Amperes
Hz Hertz
Protective Earth
On
Off
CLASS II double insulation
IPX4 Motor Protected against splashing water

CONNECTION TO POWER (115V)

The SD1/CSD1 Stinger/CSV Model uses a 15 amperes NEMA Non-polarized 1-15P plug shown in figure 1. It is to be used in conjunction with a 5-15R or 5-20R properly wired receptacles.

Figure 1



Figure 2

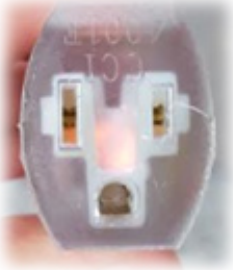


Figure 3



TORQUE SETTINGS FOR FASTENERS:

Screws utilized			
Part Number	Description	Location	Torque setting
013572-00000	M4.55 X 1.59 X 14MM; T20 TORX; THREAD FORMING SCREW	STINGER	20 IN-LBS
006215-1.250	5/16-18 X 1-1/4 SHCS ZINC	STINGER	50 IN-LBS
013580-00000	No 4 X 3/8 ZINC SCREW	STINGER	3 IN-LBS
006212-3.250	8-32 X 3-1/4 SHCS ZINC	MOTOR POD ASSEMBLY	15 IN-LBS
013565-00000	4-20 X 3/8 THREAD FORMING SCREW	BRUSH ASSEMBLY	10 IN -LBS
013565-00000	4-20 X 3/8 THREAD FORMING SCREW	SWITCH GUARD	5 IN-LBS

Care and Maintenance

- Check grease on axle shaft and caster wheels weekly. Use a grease gun to grease each zerk on each wheel.
- If transporting in the assembled position, ensure that the ball and motor assembly do not bounce or jolt during transportation by properly securing any possible moving components. Note: While securing the moving components be sure not to strap or tighten on the shaft, motor or ball which could potentially bend or stress components.

NOTICE

All safety labels on Minnich Manufacturing units have been carefully placed so they can be easily seen at all times. There are several different types of labels on the units. Always keep these warnings free of dirt, concrete, or anything else that restricts visibility. Never remove the labels for any reason. If the label on your machine become worn or in any way difficult to read, call our parts department for replacements.

A

MINNICH
MV KELLY

B

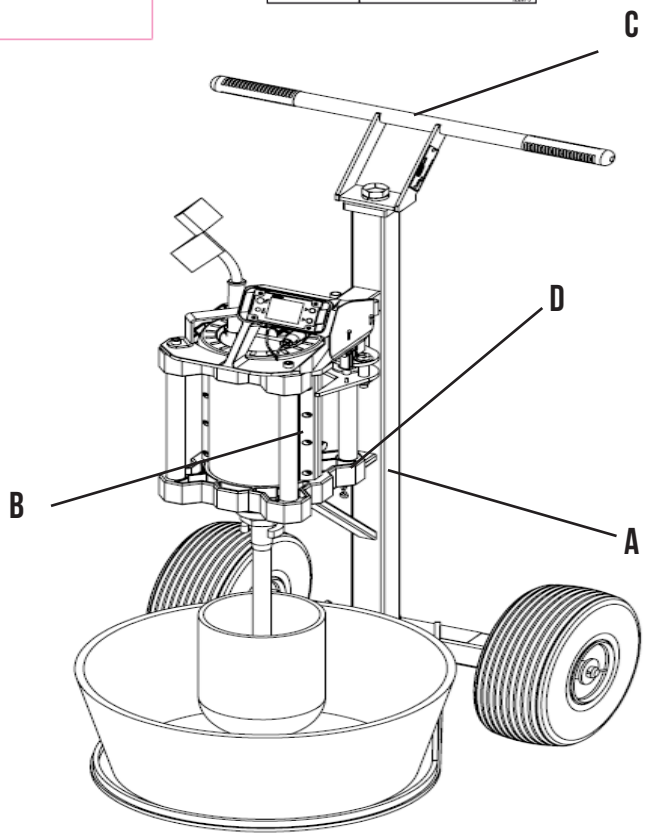


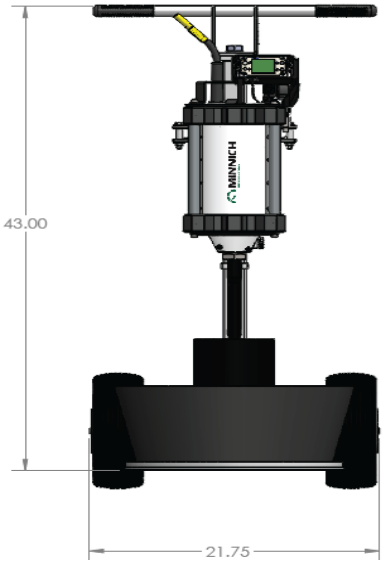
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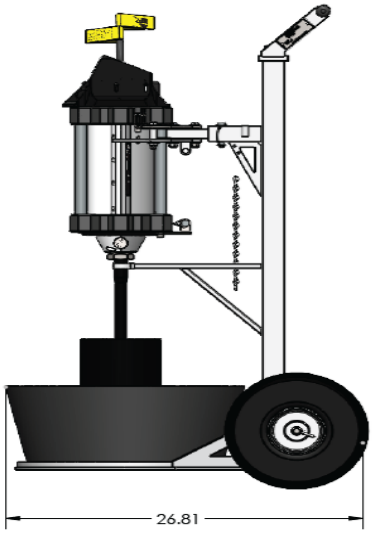
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MV KELLY

D









Sample Calculation

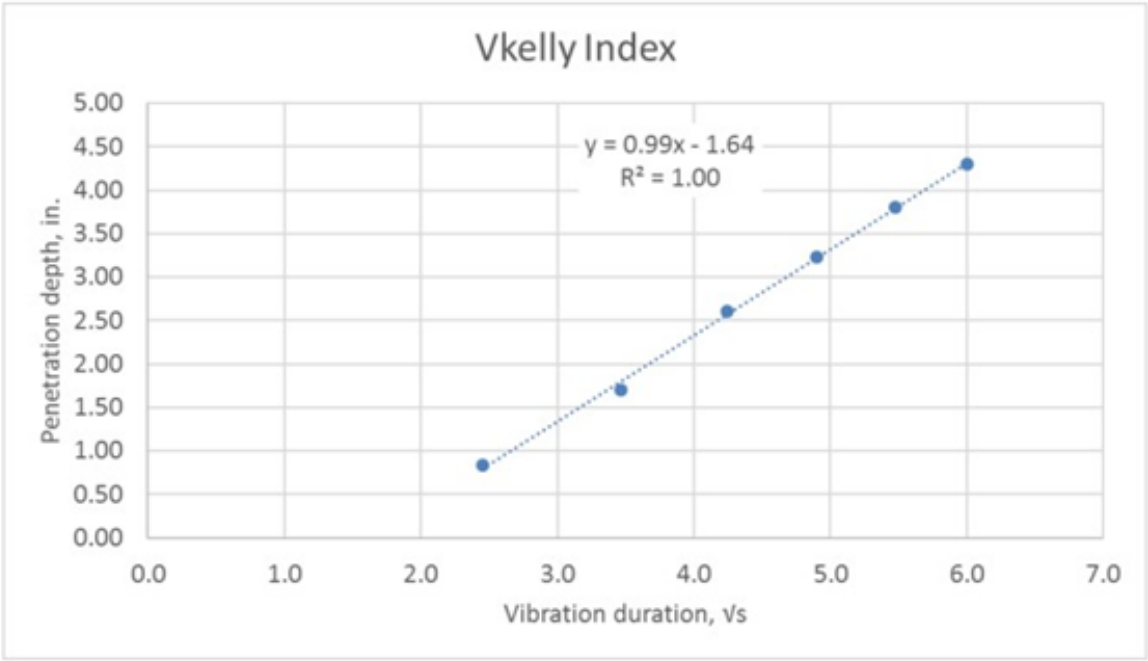
ACTUAL FORMULA PAGE: 15

		PENETRATION DEPTH, INCH				VKELLY SLUMP
STATIC	STATUS	FIRST	SECOND	THIRD	AVERAGE	
	At contact	0.5	0.6	0.7	0.6	1.9
	At weight	1.5	1.6	1.5	1.5	

Figure 3- Static slump calculation

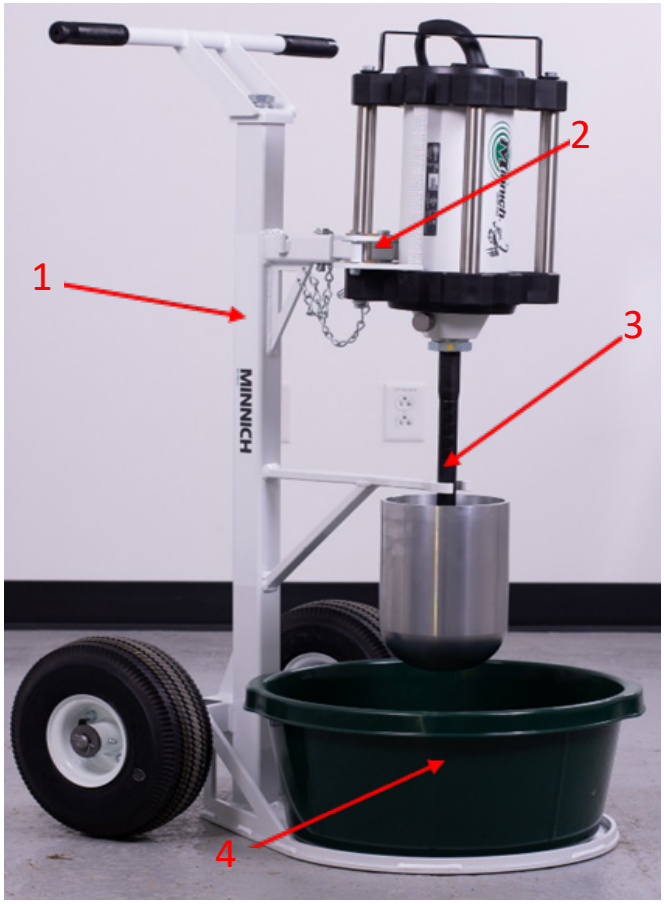
	TIME, s	SQUARE ROOT OF TIME, √s	PENETRATION DEPTH, INCH				INCREMENT, IN.	VKELLY INDEX (Slope)
			FIRST	SECOND	THIRD	AVERAGE		
DYNAMIC	0	0.0	1.5	1.6	1.5	1.5		
	6	2.4	2.4	2.4	2.3	2.4	0.83	
	12	3.5	3.1	3.3	3.3	3.2	1.70	
	18	4.2	4.1	4.2	4.1	4.1	2.60	0.99
	24	4.9	4.8	4.8	4.7	4.8	3.23	
	30	5.5	5.3	5.3	5.4	5.3	3.80	
	36	6.0	5.8	5.8	5.9	5.8	4.30	

Figure 4- Vkelly Index Calculation table



The MV-Kelly test stand consists of three main assemblies, each of which can be disconnected from each other for transportation and storage.

1. Frame
2. Motor and motor slider
3. Kelly ball and shaft
4. Sampling bin



To assemble:

1. Insert motor and motor slider into the square tube on the frame and insert its corresponding locking pin.
2. Insert the ball and shaft into the motor housing, be sure to properly align the square drive key before inserting. Insert the corresponding locking pin into the ball and shaft locking bracket.
3. Place the sampling bin below on the frames tray.
4. Connect the motor to (standard 120V outlet) power. (Be sure to read and understand docu mentation and material also provided with the CSV motor)

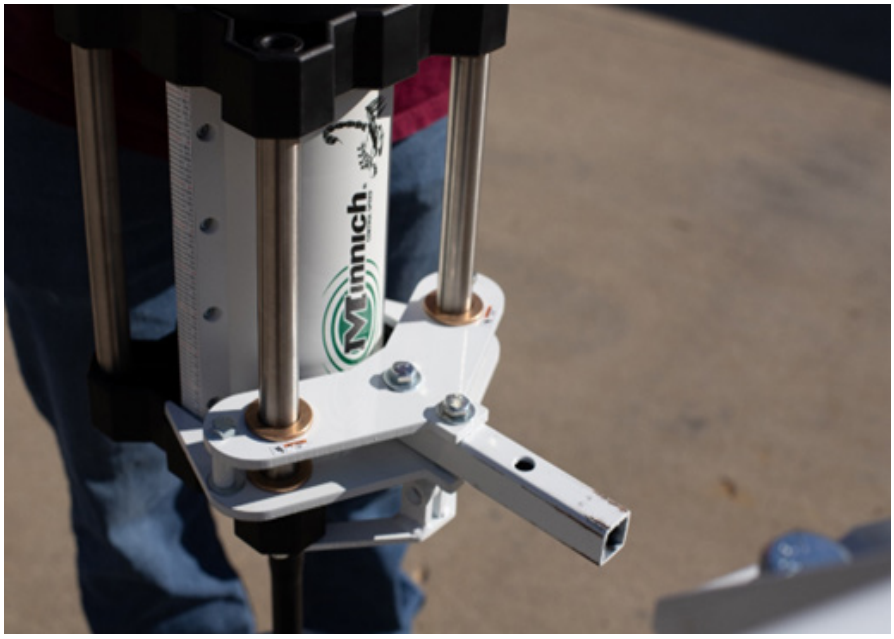
The MV-Kelly is now ready for operation.

To prepare for transport:

1. Remove the sampling bin. (4)
2. Remove the ball from the motor; disconnect the locking pin and slide the ball and shaft out of the motor, be sure to not lose the square key which enables power between the motor and the shaft.







3. Remove the pin which holds the ball and motor up and place it in one of the pin holders.
4. Remove the pin on the square tube which connects the motor slider to the frame. Place the pin in one of the pin holders.
5. Now the motor and motor slider can slide out from the square tube on the frame.
6. With the three assemblies properly disconnected from each other, they can now be safely secured for transportation.

TEST PROCEDURE

Vibrating Kelly ball (V-Kelly) Test Procedure
For additional information, reference AASHTO T129
Static Test:

1. Sample fresh concrete according to AASHTO R 60 – Sampling Freshly Mixed Concrete.
2. Place concrete in the rubber tub and create a level surface. Do not consolidate the concrete.
3. Pull out the pin holding the graduated shaft while holding the shaft to prevent it from dropping.
4. Gently lower the ball until it touches the surface of the concrete.
5. Record the initial reading on the graduated scale to the nearest 2.5 mm (0.1 in.).
6. Allow the ball to sink on its own weight by releasing the shaft.
7. As the ball comes to rest, record the static depth to the nearest 2.5 mm (0.1 in.).



Figure 1- Depth of Penetration under Static Load



Figure 2- Depth of Penetration under Dynamic Load

Dynamic Test:

1. After completion of static test, note the final measurement of the static test as this will be the "zero" for the dynamic test. While leaving the ball in its place, turn on the vibrator and simulta neously start the timer. Set the CSV to 4,000 RPM.
2. Record the depth readings on the graduated shaft every 6 seconds up to 36 seconds. Stop the test if the top of the ball reaches the surface of the concrete.
   Note: One way to collect data is to use a video recorder to monitor the graduated scale for the duration of the test. Alternatively, a digital laser measurer (Bosch Professional GLM 40 or similar) can be installed on the top bar to help record the ball penetration depth during vibration.
3. In the lab, remix the concrete in a mixer for about 30 seconds then repeat the test. In the field, repeat the test using fresh concrete from the same sample load.
4. Take a minimum of three individual sets of readings. Individual readings should agree within 12.5 mm (0.5 in.) of penetration at any given time.

Calculation

1. Static load- Calculate the depth of penetration for the three repeats and determine an average. Multiply by 2 (Koehler and Fowler, 2003) to obtain the slump equivalent (VKelly slump) and report to the nearest 5 mm (1/4 in.). This acts as a measure of consistency.

2. Dynamic load- Calculate the average depth of penetration after three repeats. Plot the penetration in inches (millimeters) against the square root of time in seconds. Draw aline of best fit.

$$D = V\sqrt{t} + C$$

Where:

D= penetration depth at time t,
t= elapsed time of vibration (s),
c= constant (non-zero), and
V= Vkelly Index

The slope of the line of best fit is the VKelly Index. A Vkelly Index of 0.8-1.2in/√s (2-3 cm/√s) is. considered good. CALCULATION EXAMPLE: PAGE 11

Credit:
Instructions closely follow NCPTC test procedure, this document has been edited for clarification and formatting purposes. Please refer to original document:

National Concrete Pavement Technology Center. (2018, October 30). Vibrating Kelly Ball (V-kelly) test procedure. https://intrans.iastate.edu/app/uploads/sites/7/2018/12/Procedure-Vibrating-Kelly-Ball.pdf

HOBO Logger (MX1104) and HOBOconnect Navigation
HOBO Device



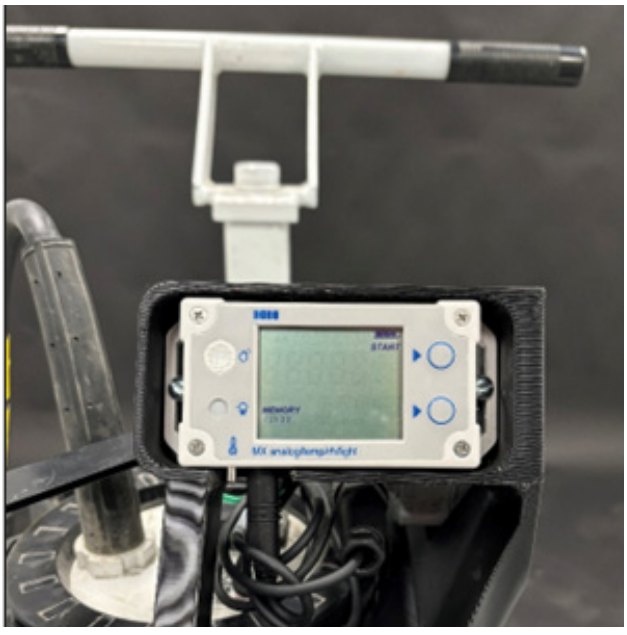
1) The LCD screen is on a ten-minute timer and will auto-shutoff. If the screen is off press and hold the top or bottom button on the right-hand side for one second to wake.



2) The screen will wake and display similarly as shown.



3) To start/stop the logging of the device hold the top right-hand button for three seconds until the screen has no display readings.



4) Image shows HOBO no longer logging.

Relative Humidity (RH%) Sensor



Light (Lum)

Temperature (F°/C°)

Analog Sensor Voltage/Amperage (V/Amp)



6) To change between the four sensor channels, tap the top button on the right-hand side one time.



(Volt/Amp)



Temp



RH%

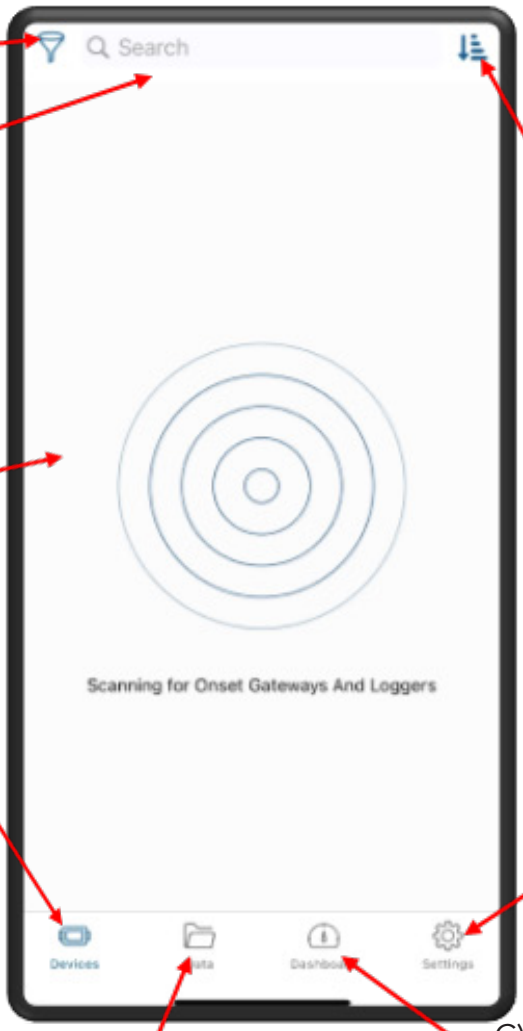


Light

HOBOconnect Mobile App

From the homepage of the app, this is where you will find where to connect to HOBO loggers, see your saved data, explore a dashboard of personalized widgets, and the app settings.

Filter through your different devices or use the search bar.



Sort your devices by name, group, serial #, and model. App defaults to sort by discovery time.

A) HOBOconnect will automatically find nearby devices.

D) User settings can be found here.

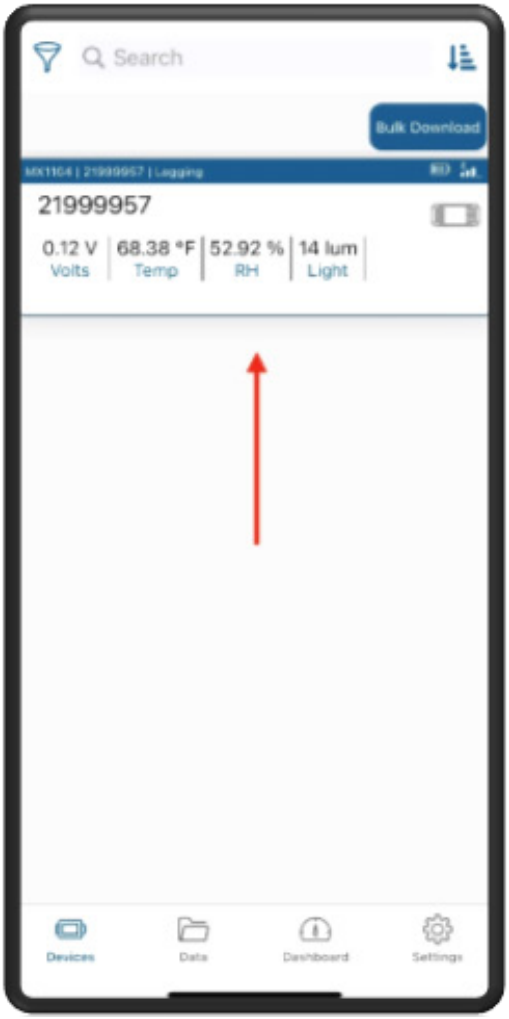
B) Any saved logs from a HOBO device will be stored here.

C) The Dashboard allows the user to view any sensor data from multiple HOBO Loggers simultaneously.

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A) Page 6-7
B) Page 8
C) Page 9
D) Page 10

A) Devices



The Bulk Download feature saves you time and allows you to download data easily and efficiently. You can download data from up to twenty loggers at a time, without having to connect to each logger.

The app will show a list of nearby devices. Select the device you want to connect to when displayed.

A) Devices

Quick view of the HOBO device sensor readings, logging status, and device battery level.

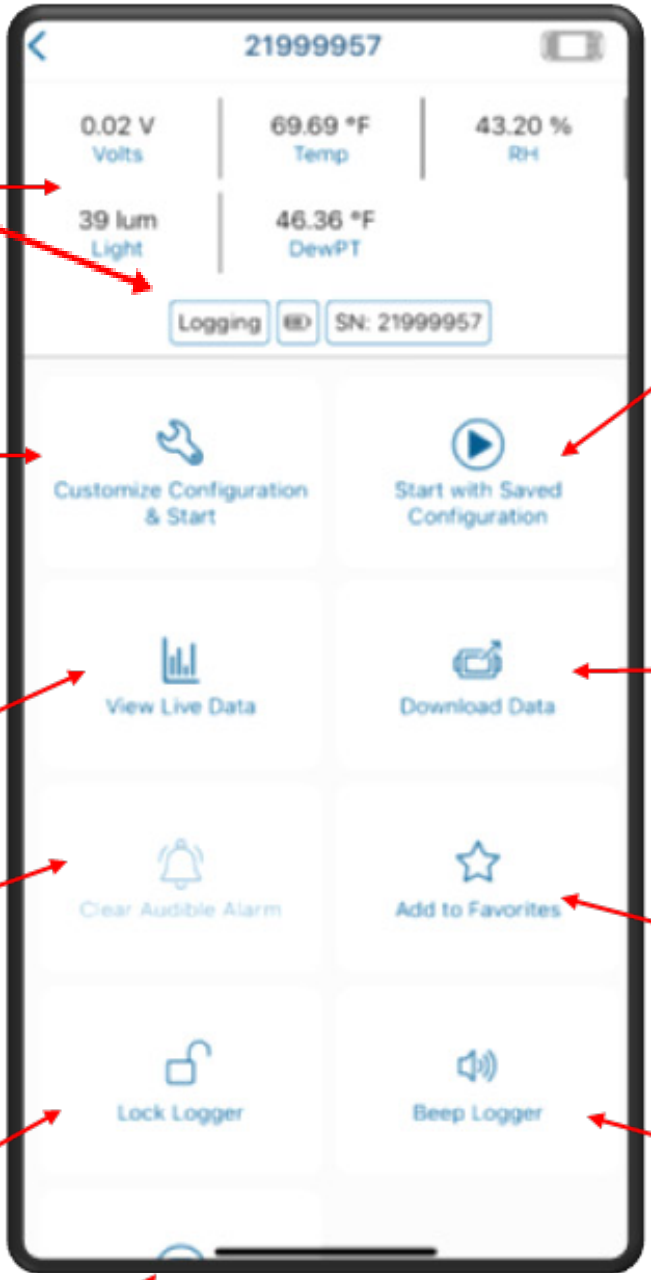
Customize the configuration to your needs such as the device name, logger settings, change the analog sensor type, temperature, relative humidity, light, and alarm settings.

View a live graph of the four sensors.

Clear any audible alarms present.

Lock the HOBO logger with a password.

Stop or pause the HOBO logger.



This option allows you to apply the same configuration quickly and consistently across loggers within the same family. A saved configuration is specific to an installation of HOBOconnect and cannot be shared across devices.

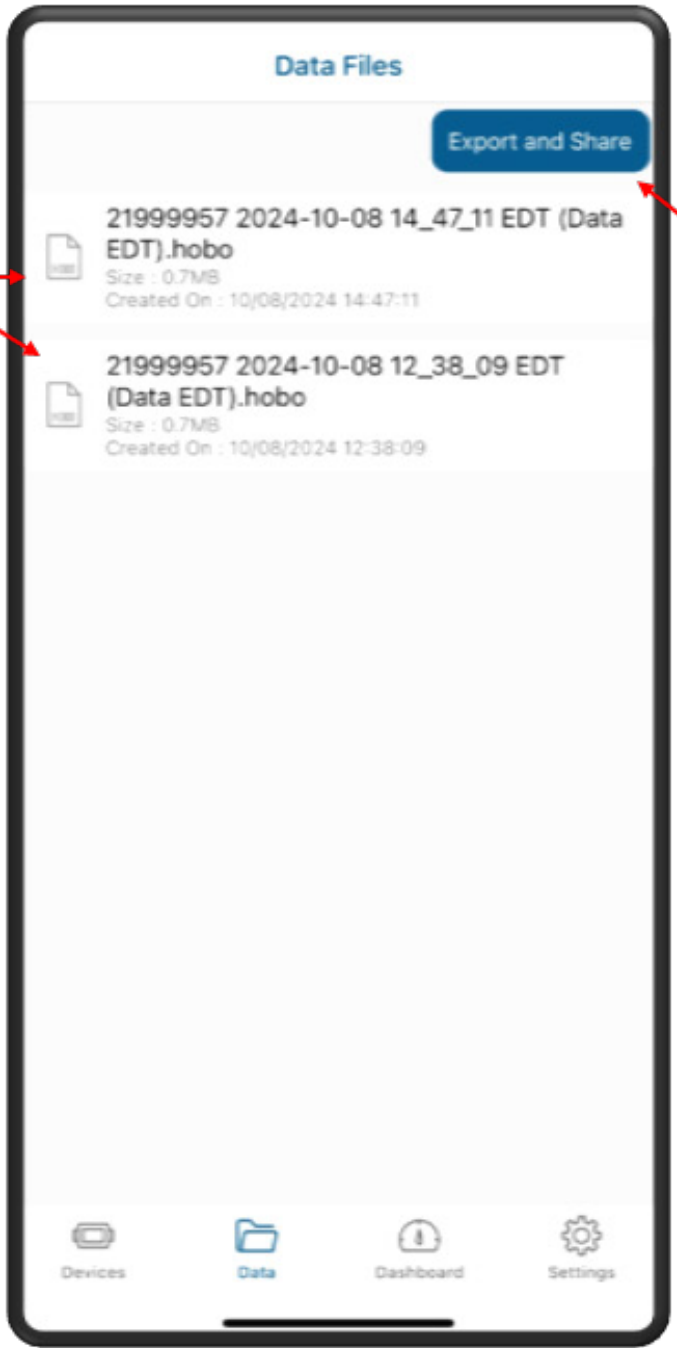
Download data to keep and export.

Favorite this specific HOBO device.

Play an audible beep to locate HOBO logger.

B) Data

Data log files can be exported individually or altogether.

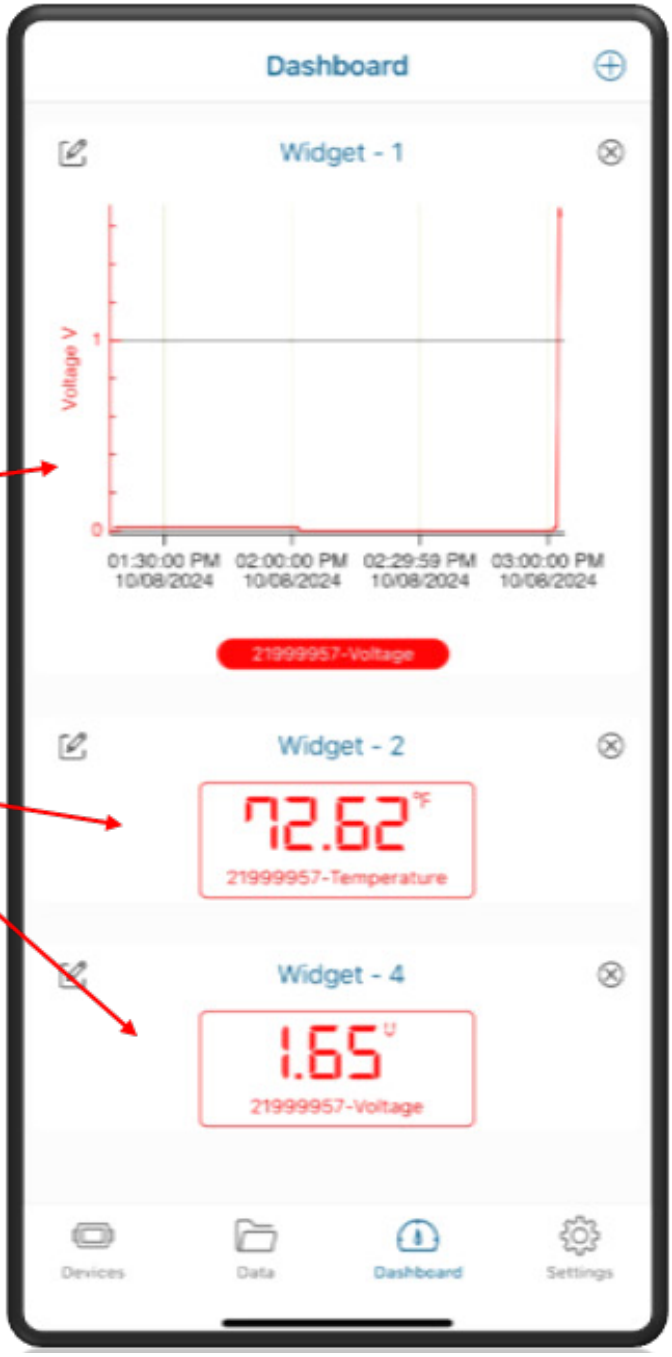


Export and share data via email, text message, or any compatible apps.

C) Dashboard

Set up a Dashboard to quickly view the latest readings from loggers within range of the phone or tablet without having to connect to them. This requires the logger to be awake with Bluetooth enabled.

Examples of different widgets users can display on their Dashboard.

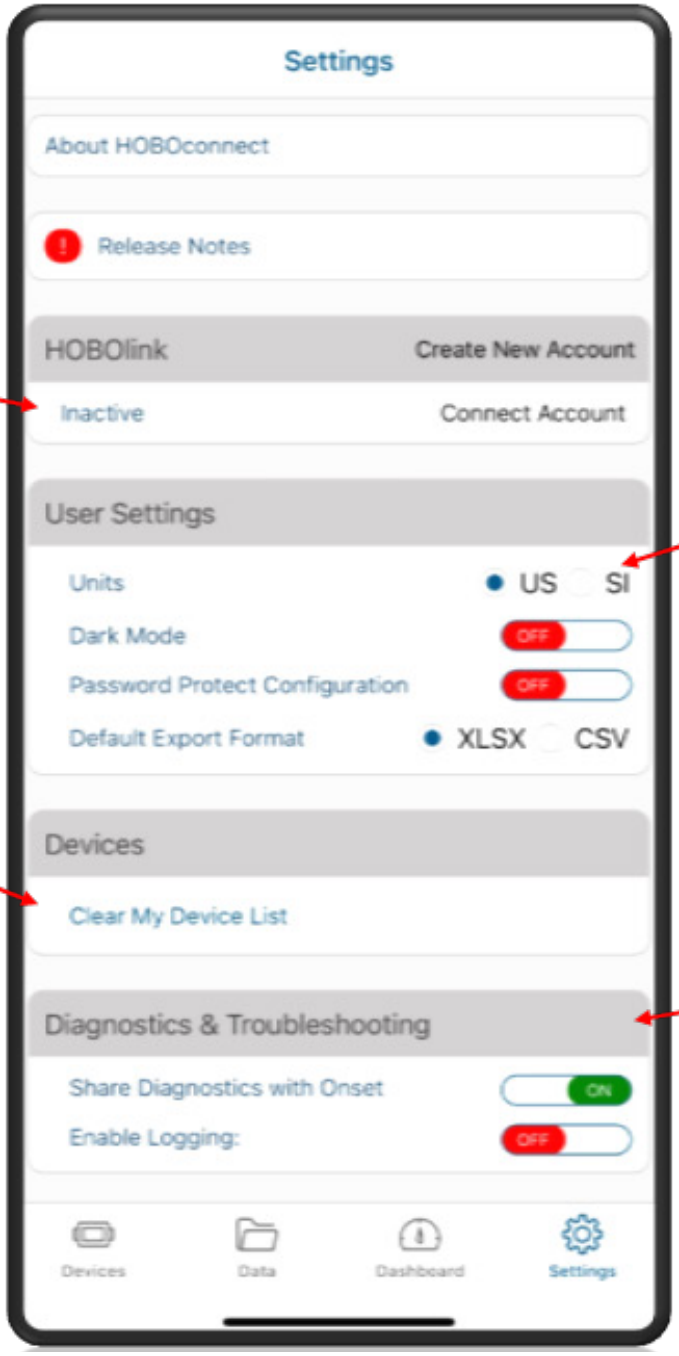


D) Settings

HOBOconnect app settings allow the user to customize specific settings to their liking/needs.

Connect a HOBOlink account to the app so that logged data can be automatically uploaded to www.hobolink.com, where you can further analyze the data, set up dashboards, and more.

Clear My Devices List works in conjunction with the My Devices filter in which only the devices that your phone or tablet has connected to are shown in the Devices screen.



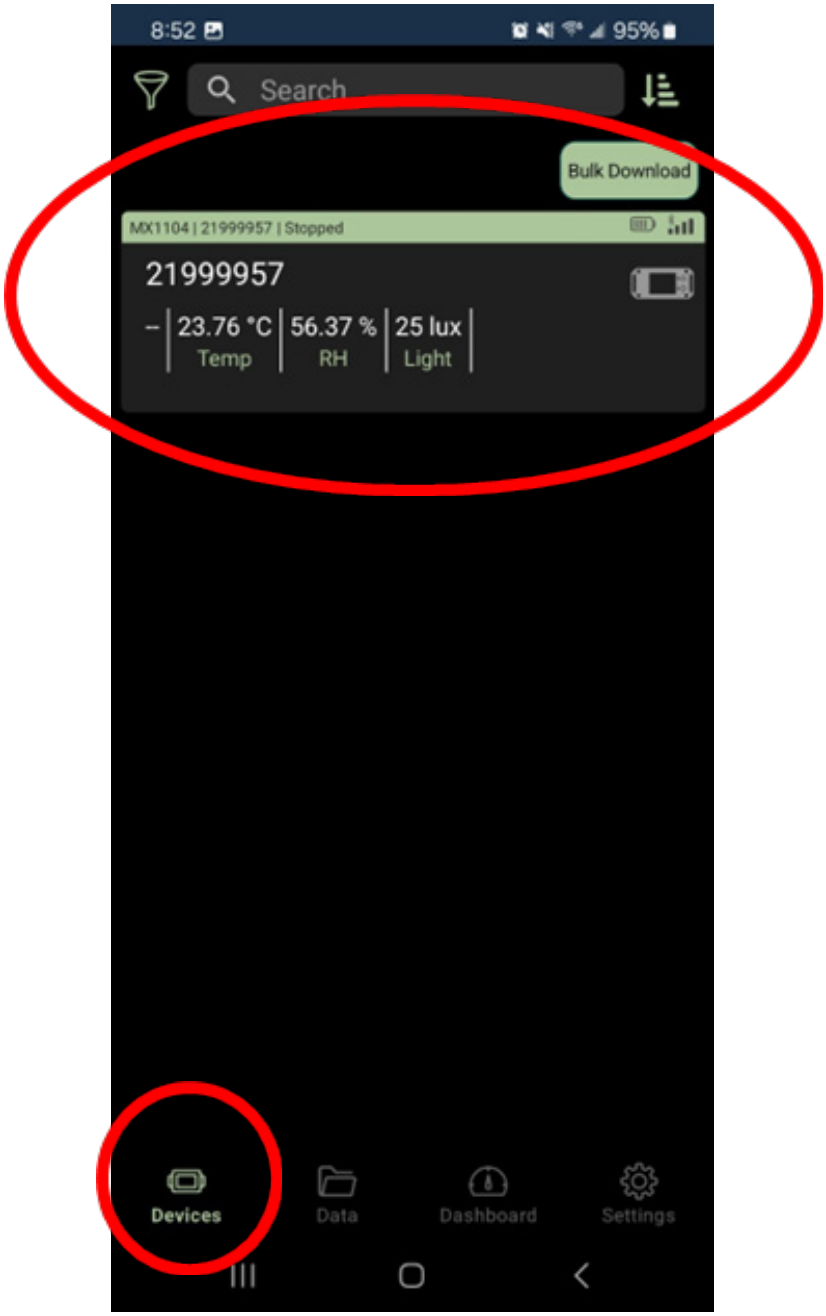
Here you can select either US or SI units. Any changes to units will take effect immediately throughout the app. The units displayed on the logger LCD (if applicable) will be updated the next time the logger is configured. You can also access dark mode for your screen, add a password to your configuration so it cannot be changed, and select the default export format.

These settings control the information that is gathered and shared with Onset.

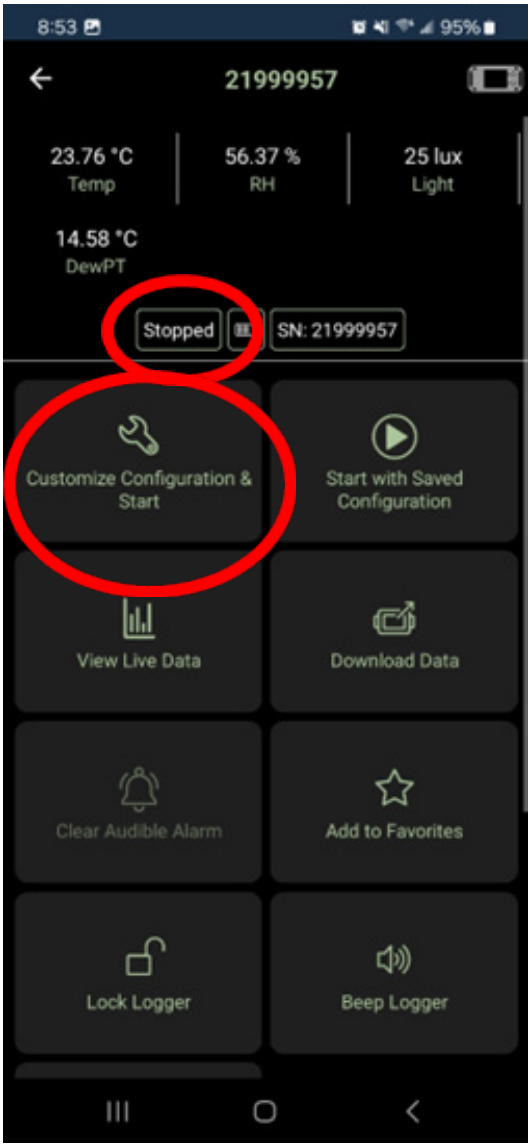
MV-Kelly Instructions

Open the HOBOconnect app from the App Store/Google Play and set up an account. Ensure the HOBO MX1104 data logger is on and connected to the string pot on the VKelly.

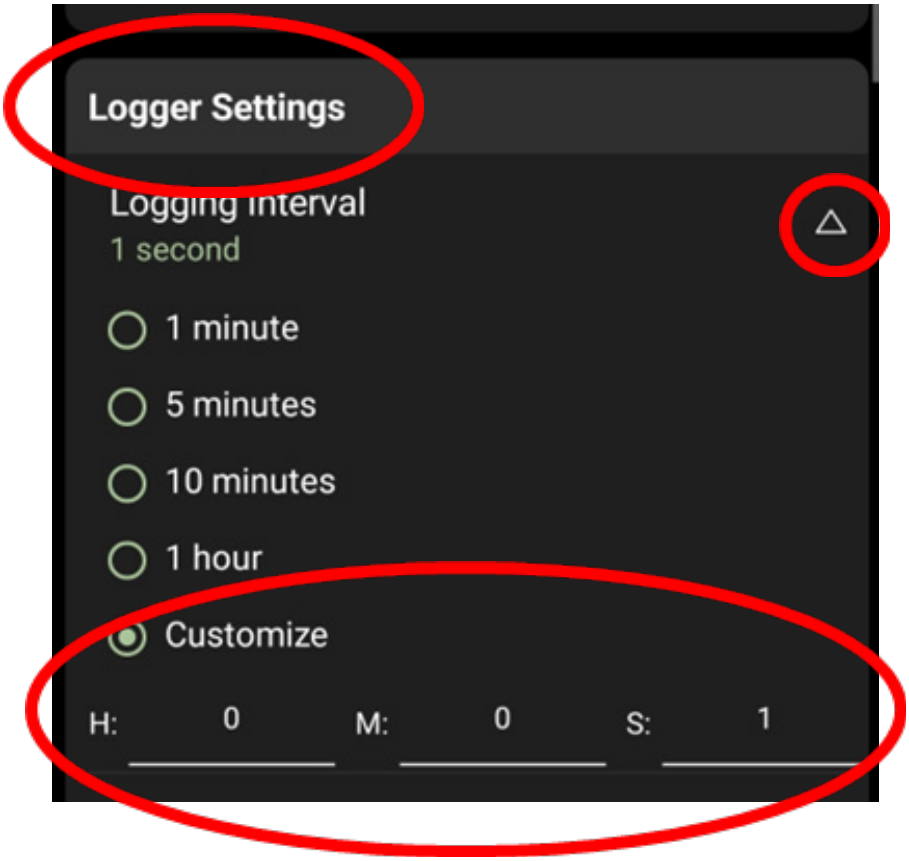
1. Open Minnich Monitor App and connect to the VKelly. Exit Minnich Monitor.
2. Open HOBOconnect. The app should open in the "Devices" tab, and after a few seconds, the data logger should appear. Select the data logger to connect.



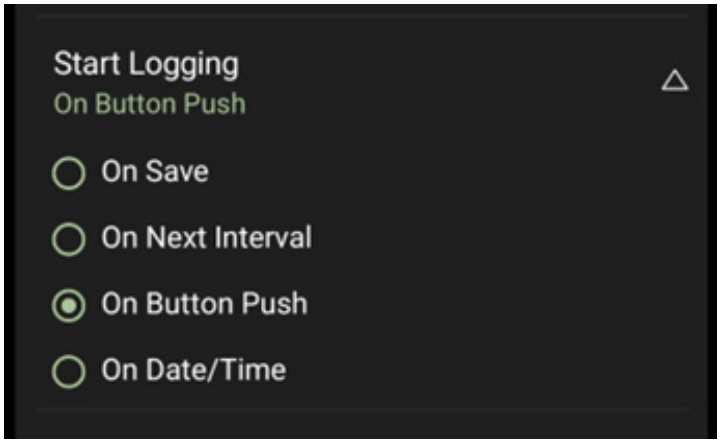
3. After connecting to the data logger, select "Customize Configuration & Start." The app may prompt you to warn you that you will erase the existing configuration – go ahead and proceed. Note: It's possible that the data logger could be actively logging data when you connect to it. When it is logging data, the device's status will read "Logging" instead of "Stopped" at the circled location in the image below. When you click "Customize Configuration & Start," the app will prompt you to check whether you want to save the data the logger was collecting before you proceed.



4. Within the "Customize Configuration & Start" page, under "Logger Settings," open the "Logging Interval" tab by selecting the arrow on the right side. From there, select "Customize" and set the logging interval to 1 second. (This interval is the shortest possible value allowed by the app.)

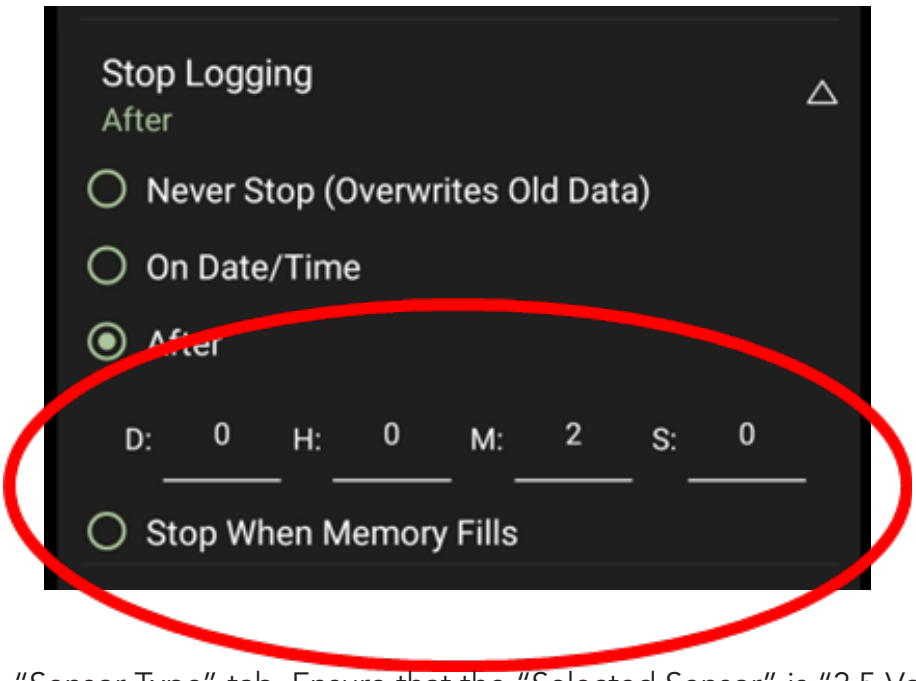


5. Open the "Start Logging" tab and select "On Button Push."



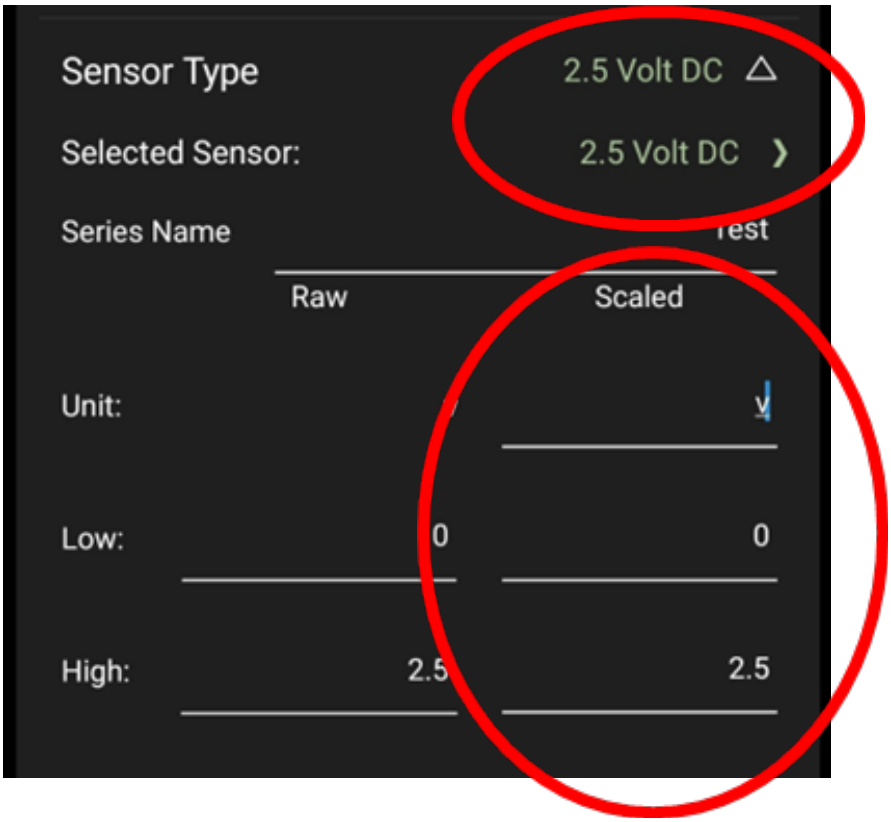
6. Open the "Stop Logging" tab, select "After," and enter a time value. This value sets the amount of time that the logger will collect data during each test.

Note: While the MV-Kelly test only requires 36 seconds of data collection, you will need to program a longer time interval, as it takes some additional time to begin the VKelly test itself after starting the data logger. In the image below, we've selected two minutes. As you gain proficiency with test, you can likely use a shorter interval.

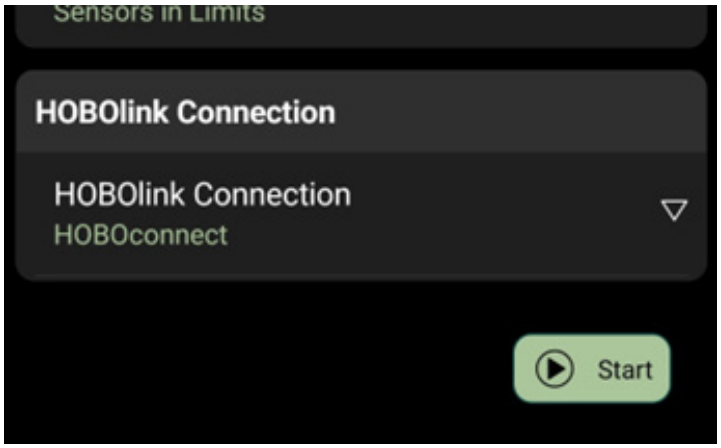


7. Open the "Sensor Type" tab. Ensure that the "Selected Sensor" is "2.5 Volt DC." Under "Series Name," you will need to enter a scaled unit and low and high scaled values that correspond to the raw voltage measurements.

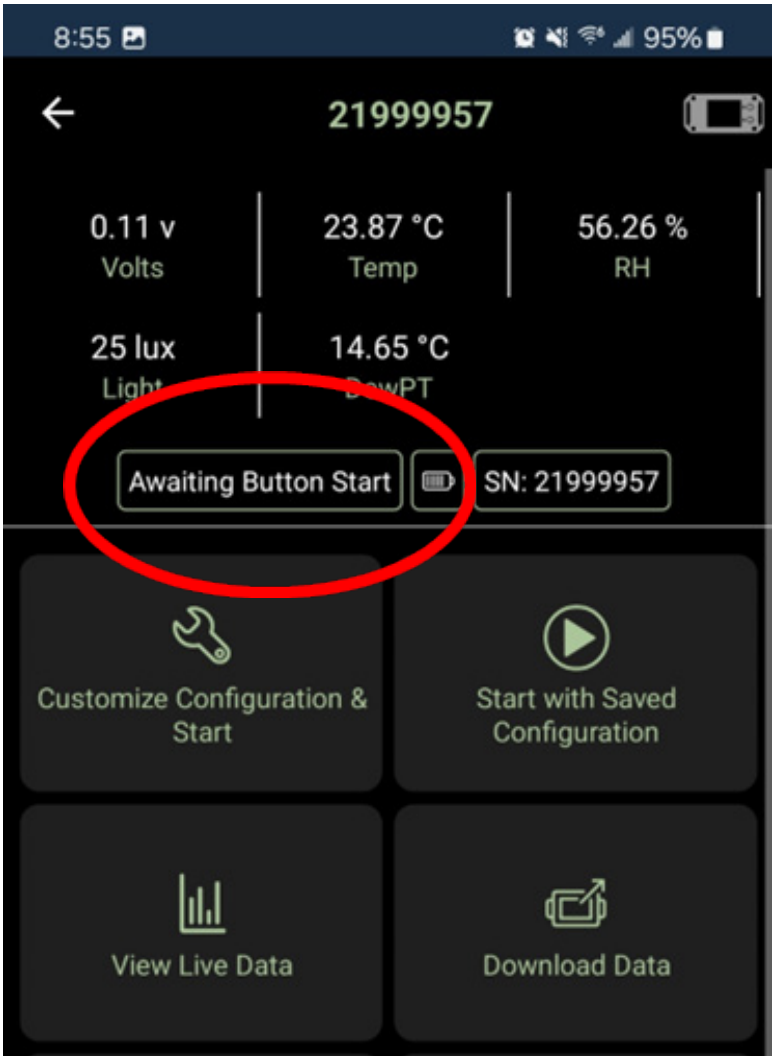
Note: We have not yet been able to successfully get the data logger to output scaled values in terms of inches or mm, so we simply copy the voltage measurements, as in the image below.



8. Scroll to the bottom and press "Start" at the bottom of the screen. Note that data collection does not immediately begin at this stage.

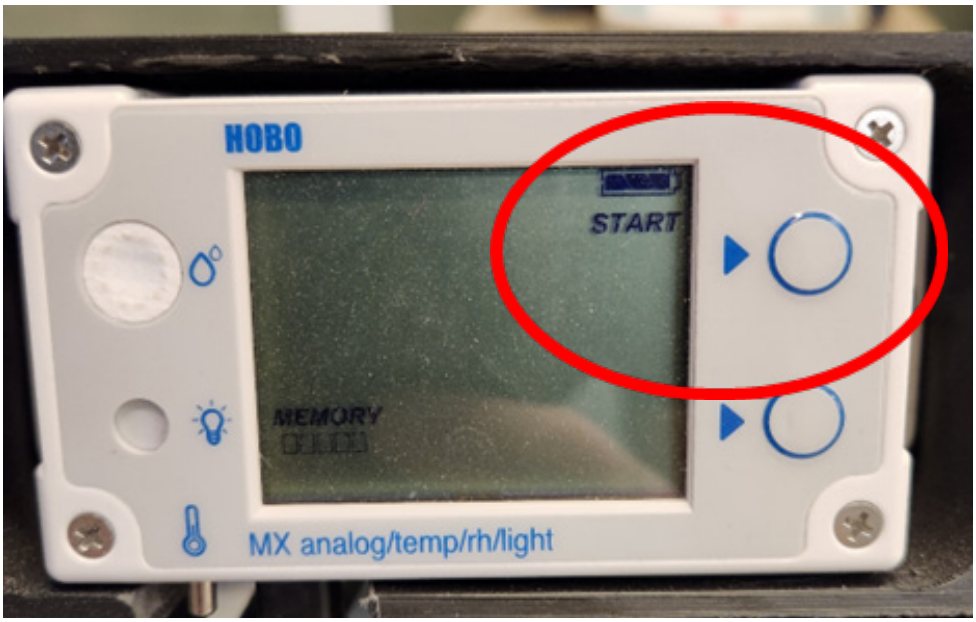


9. You will return to the following screen. Note that the device status is now "Awaiting Button Start."



10. Record the initial measurement for the point of contact with the Kelly ball with the concrete, release the Kelly ball down onto the concrete, and record the initial slump measurement once the Kelly ball settles. (These measurements must be recorded visually/manually.)

11. On the data logger, the word "Start" should appear on the screen next to the button in the top-right corner of the device. Press and hold this button for approximately three seconds to begin data collection.



The data logger will begin to display the voltage reading and the word "Logging" will appear in the bottom-left corner of the screen.



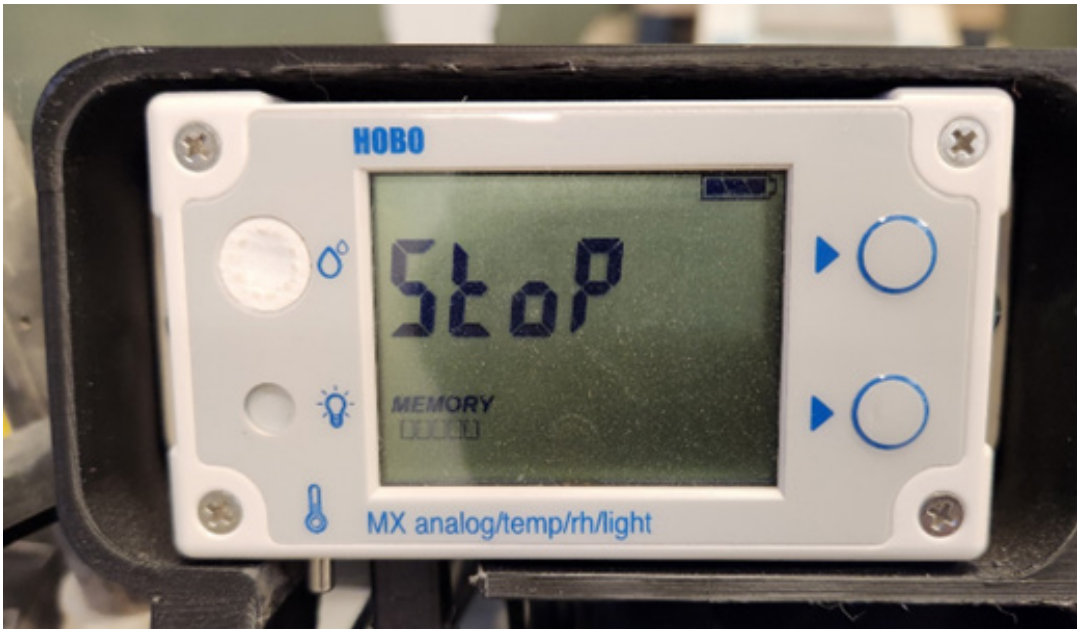
The device status within HOBOconnect will also update to "Logging."



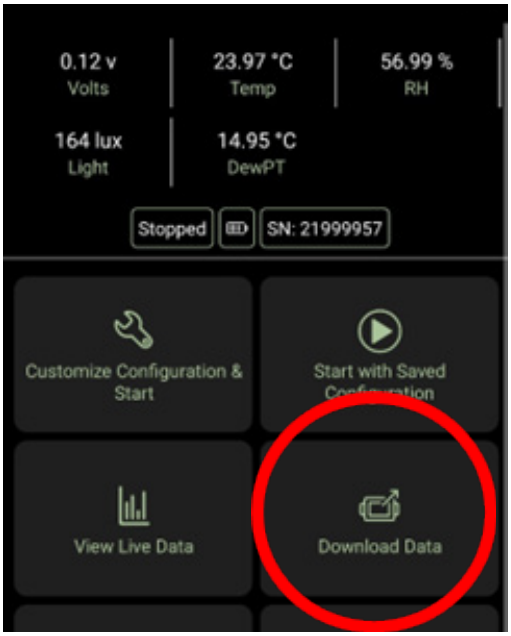
12. Close HOBOconnect and re-open Minnich Monitor. Re-connect to the device as needed. Configure the MV-Kelly to the desired testing frequency. Begin logging data within Minnich Monitor, and then turn on the MV-Kelly to begin the test.

13. Once the test is completed (at least 36 seconds), turn off the MV-Kelly and stop data logging within Minnich Monitor. Save and export the Minnich Monitor data as needed, and close the app.

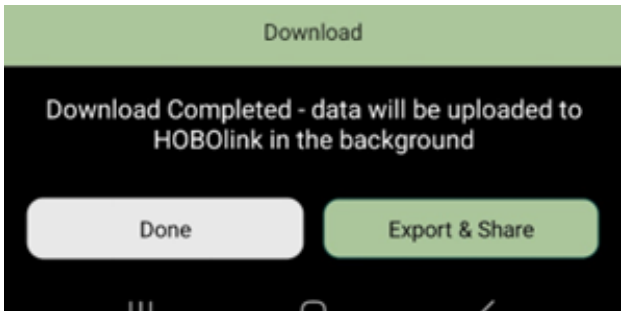
14. Once the data logger has finished collecting data, the word "Stop" will appear on the screen.



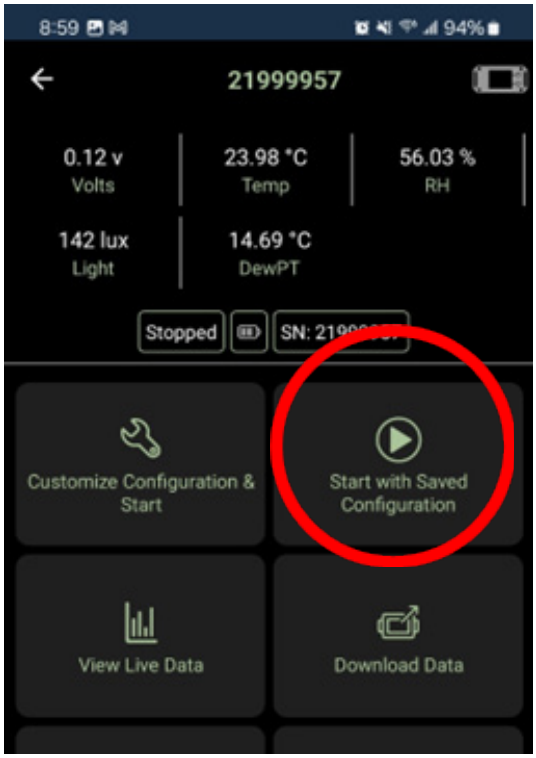
15. Re-open HOBOconnect. The indicated device status will also have returned to "Stopped." Select "Download Data."



The app will indicate that the download has completed. You are also provided an option to export and/or share the data. (This process works exactly like exporting the data in Minnich Monitor.)
Note: It is very important to remember to download the data at this step. If you begin another test without downloading, the data will be erased.



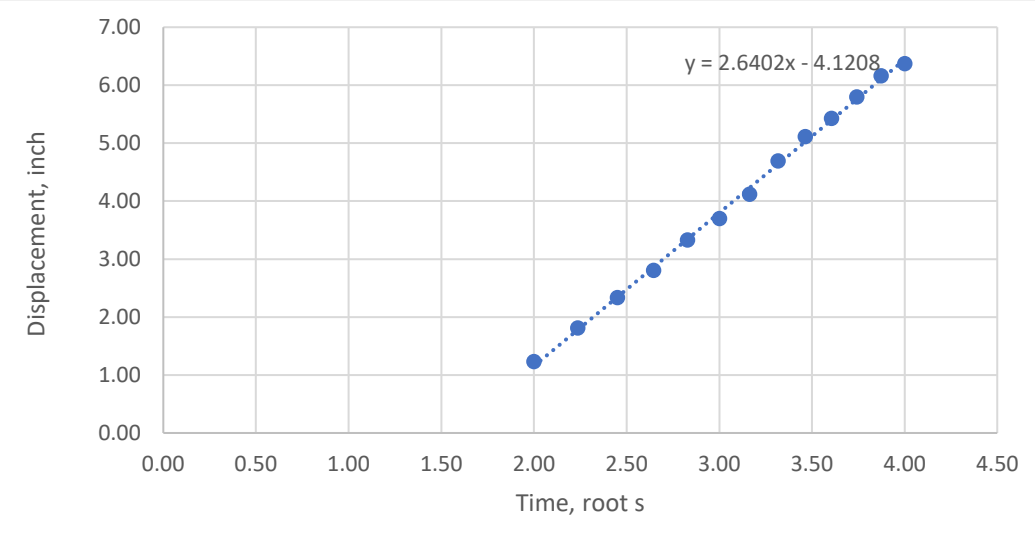
16. When you are ready to begin another test, select "Start with Saved Configuration." The device status should return to "Awaiting Button Start," as pictured in Step 9. Repeat Steps 10-15 for any subsequent test.



Note: In our limited experience using the app so far, HOBOconnect appears to periodically reset the configuration settings, even if you haven't changed them since the last time you or anyone else used the data logger. We recommend beginning the process from Step 1 for the first test every time you connect to the data logger to ensure the proper configuration settings have been selected.
Based on our experience, you should be able to tell if the settings were wrong if the test does not end after 2 minutes (or whatever recording interval you use). It appears that when HOBOconnect resets the configuration settings, it sets an indefinite logging time.

t	root t	V	inch
0	0.00	1.350	0.50
1	1.00	1.350	0.50
2	1.41	1.330	0.60
3	1.73	1.310	0.71
4	2.00	1.210	1.23
5	2.24	1.100	1.81
6	2.45	1.000	2.33
7	2.65	0.910	2.81
8	2.83	0.810	3.33
9	3.00	0.740	3.70
10	3.16	0.660	4.12
11	3.32	0.550	4.69
12	3.46	0.470	5.11
13	3.61	0.410	5.43
14	3.74	0.340	5.79
15	3.87	0.270	6.16
16	4.00	0.230	6.37
17	4.12	0.210	6.48
18	4.24	0.130	6.90
19	4.36	0.110	7.00
20	4.47	0.110	7.00
21	4.58	0.110	7.00
22	4.69	0.110	7.00
23	4.80	0.110	7.00
24	4.90	0.110	7.00
25	5.00	0.110	7.00
26	5.10	0.110	7.00
27	5.20	0.110	7.00
28	5.29	0.110	7.00

VKelly Index 2.64



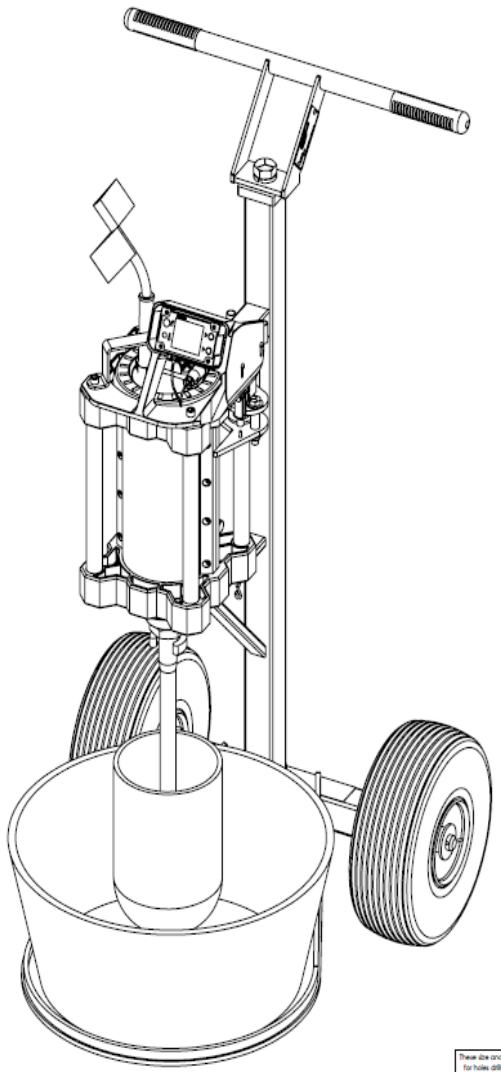
NOTICE

Δ DO NOT adjust the speed in Custom Speed settings, This is set at the correct testing speed from the factory (4,000VPM).

NOTICE

Δ Make sure that the string pot cable is free from debris at all times. Clean it off after every test to ensure proper testing results.

REVISIONS				
REV.	DESCRIPTION	DATE	APPROVED	ECR#



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	000708-00004	NAME PLATE, MODEL & SERIAL #	1
2	003016-00044	HANDLE GRIP	2
3	004675-00006	AXLE WASHER	4
4	006043-1.500	HHCS, 3/4-10 x 1-1/2 GR.5	1
5	006155-00000	LOCKWASHER, 3/4	1
6	006174-1.000	PIN, COTTER 1/8 x 1	2
7	006255-0.750	RHMS, #6-32 x 3/4 SLOTTED	2
8	006257-0.500	RHMS, #10-24 x 1/2 SLOTTED	2
9	006262-00001	SCREW, DRIVE HD RD. #4 X 1/4"	2
10	006303-0.500	#6 X 1/2" SLOTTED ROUND HEAD MACHINE SCREW	1
11	006652-00000	NUT, HEX #6-32 NC THREAD	2
12	006654-00000	NUT, HEX #10-24 NC THREAD	2
13	007282-00000	CHAIN	2
14	008479-00000	TAB LOCK PIN	1
15	010084-00000	NON-SLIP TRACK ADHESIVE BLACK X 6.00"	12
16	010728-00000	ASSY, WHEEL & TIRE	2
17	013651-00022	TUB, V-KELLY TEST	1
18	013651-00028	DECAL, V-KELLY TESTER	1
19	013651-00055	AXLE	1
20	013651-00061	DATA LOGGER MOUNT	1
21	013651-00062	STRING POT, 12 IN.	1
22	013651-00063	ANALOG DATA LOGGER	1
23	013651-00066	V-KELLEY, CLEVIS ROD END	1
24	A13651-00040	ASSEMBLY VKELLY CSV	1
25	A13651-00041	WELDMENT, HANDLE BAR	1
26	A13651-00057	WELDMENT, FRAME	1
27	A13651-00065	DATA LOGGER CABLE	1

These size and tolerances are for holes drilled with drilling machines such as mills or lathes, drill presses, or waterjet operations. The following are standard tolerances for general machine work and apply in all cases except where greater or lesser accuracy is required by design and noted.

Drilled Hole Size	Tolerance
.0135 THRU .125	+.004/-.001
.1260 THRU .250	+.005/-.001
.2510 THRU .500	+.006/-.001
.5010 THRU .750	+.008/-.001
.7510 THRU 1.00	+.010/-.001
1.001 THRU 2.00	+.012/-.001

TOLERANCES (EXCEPT AS NOTED)
.X ± .060
.XX ± .030
.XXX ± .005
X/X ± 1/16"
< ± 1°

Dimension in accordance with ANSI Y14

FIXTURE NO. | LOCATION | ROUTING NO.

RAW MATERIAL | MATERIAL | STOCK SIZE

MINNICH MFG. CO., INC.

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DO NOT SCALE DRAWING

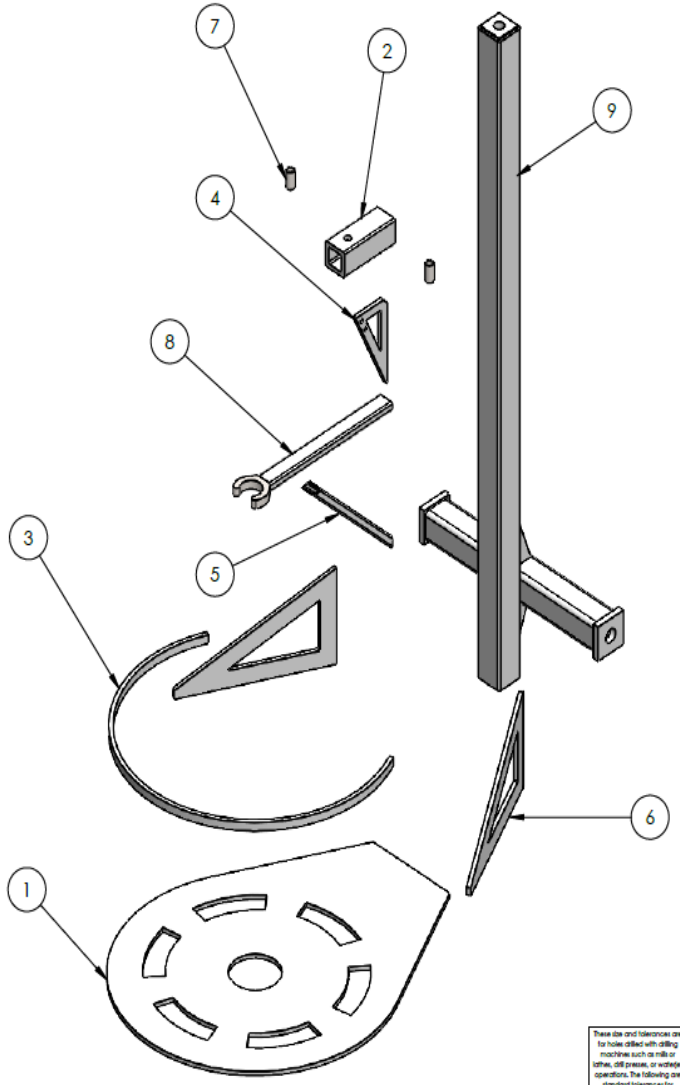
DRAWN BY: TP
CHECKED BY: RJ
APPROVED BY: AEB
ORIG DATE: 4/20/2022

TITLE: ASSEMBLY, VKELLY TEST UNIT

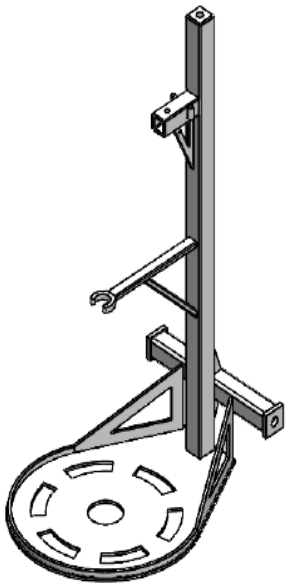
DRAWING NUMBER: A13651-00033

REV. LEVEL -

REVISIONS				
REV.	DESCRIPTION	DATE	APPROVED	ECR#



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	013651-00042	BASE PLATE	1
2	013651-00043	MOUNTING TUBE	1
3	013651-00046	RETAINING RING	1
4	013651-00048	TUBE GUSSET	1
5	013651-00049	SHAFT REST BRACE	1
6	013651-00050	BASE PLATE GUSSET	2
7	013663-1.000	RD. TUBE 0.5" OD X .049" WALL	2
8	A13651-00052	SHAFT REST	1
9	A13651-00056	WELDMT, FRAME TUBE AND AXLE HOUSING	1



These dia and tolerances are for holes drilled with drilling machines such as mills or lathes, drill presses, or waterjet operations. The following are standard tolerances for general machine work and apply in all cases except where greater or lesser accuracy is required by design and noted.	Drilled Hole Size	Tolerance
	.0135 THRU .125	+.004/-.001
	.1260 THRU .250	+.005/-.001
	.2510 THRU .500	+.006/-.001
	.5010 THRU .750	+.008/-.001
	.7510 THRU 1.00	+.010/-.001
	1.001 THRU 2.00	+.012/-.001

TOLERANCES (EXCEPT AS NOTED)
.X ± .060
.XX ± .030
.XXX ± .005
X/X ± 1/16"
< ± 1°

Dimension in accordance with ANSI Y14

FIXTURE NO. | LOCATION | ROUTING NO.

RAW MATERIAL/ MATERIAL | STOCK SIZE

MINNICH MFG CO. INC.
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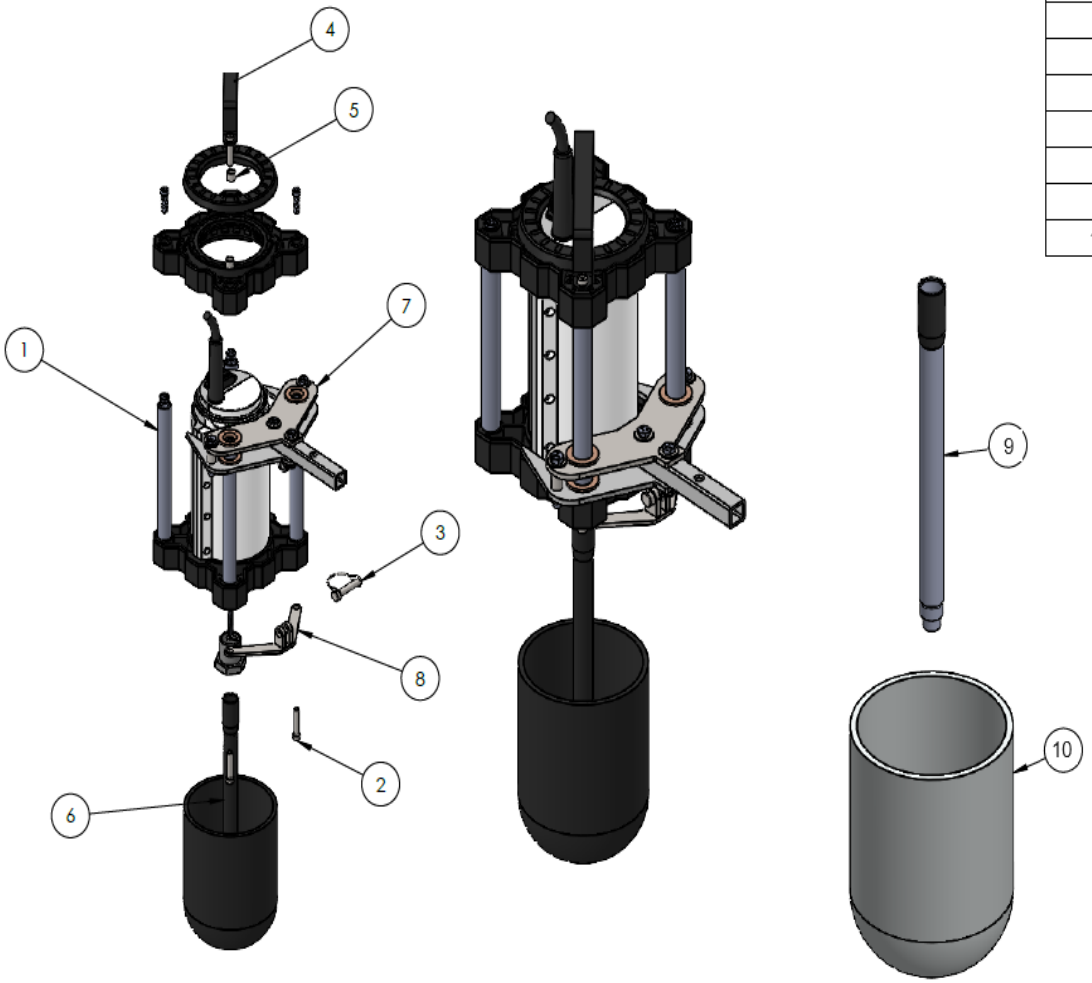
DO NOT SCALE DRAWING

TITLE: WELDMENT, FRAME

DRAWING NUMBER: A13651-00057

DRAWN BY:	CHECKED BY:	APPROVED BY:	ORIG DATE:	REV. LEVEL
TP	RJ	AEB	4/20/2022	-

REVISIONS				
REV.	DESCRIPTION	DATE	APPROVED	ECR#



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	402-01-00-00000	115V CSV	1
2	006215-1.750	5/16"-18 X 1-3/4" S.H.C.S.	4
3	008479-00000	TAB LOCK PIN	1
4	013651-00026	HANDLE, V-KELLY	1
5	013663-.5250	RD. TUBE 0.5" OD X .049" WALL	4
6	A13651-00020	ASSY, V-KELLY TEST BALL	1
7	A13651-00035	ASSEMBLY, GUIDE BRACKET	1
8	A13651-00039	WELDMT, PIN TAB BRACKET	1
9	013651-00002	WEIGHT, V-KELLEY TEST	1
10	0A2231-000SP	3/4" THREADED VIBE HEAD	1

These size and tolerances are for holes drilled with drilling machines such as mills or lathes, drill presses, or waterjet operations. The following are standard tolerances for general machine work and apply in all cases except where greater or lesser accuracy is required by design and noted.

Drilled Hole Size	Tolerance
.0135 THRU .125	+.004/-.001
.1260 THRU .250	+.005/-.001
.2510 THRU .500	+.006/-.001
.5010 THRU .750	+.008/-.001
.7510 THRU 1.00	+.010/-.001
1.001 THRU 2.00	+.012/-.001

TOLERANCES (EXCEPT AS NOTED)
.X ± .060
.XX ± .030
.XXX ± .005
X/X ± 1/16"
< ± 1°

Dimension in accordance with ANSI Y14

FIXTURE NO. | LOCATION | ROUTING NO.

RAW MATERIAL/ MATERIAL | STOCK SIZE

MINNICH MFG. CO., INC.

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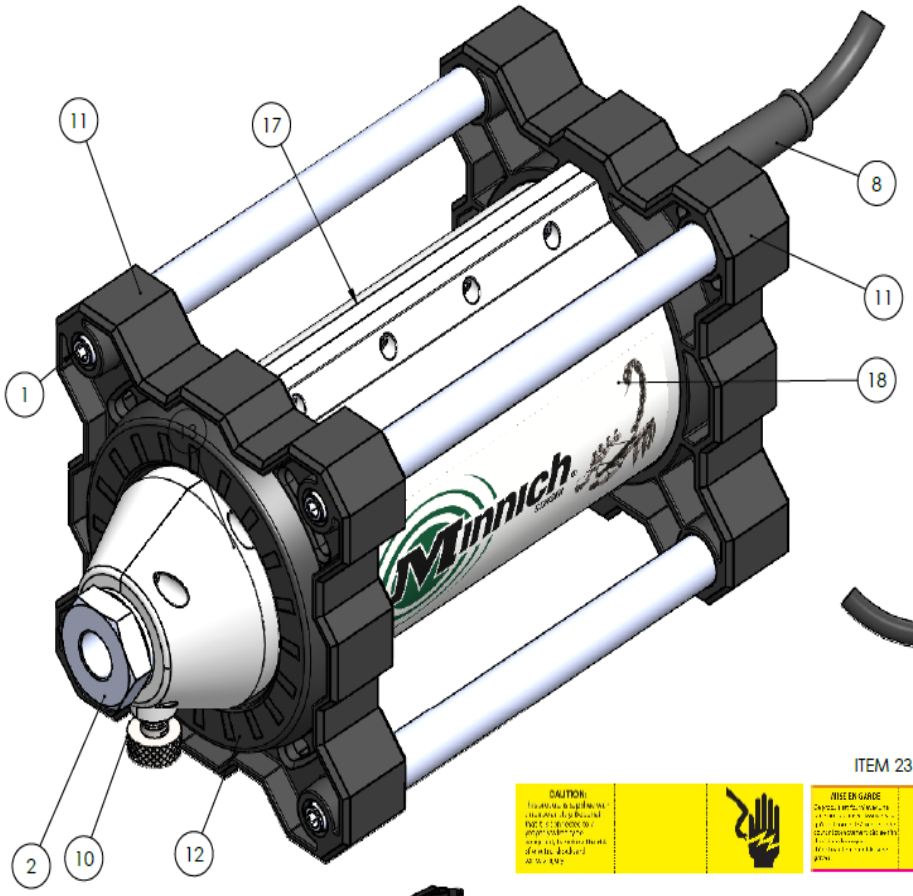
DO NOT SCALE DRAWING

TITLE: ASSEMBLY, VKELLY CSV

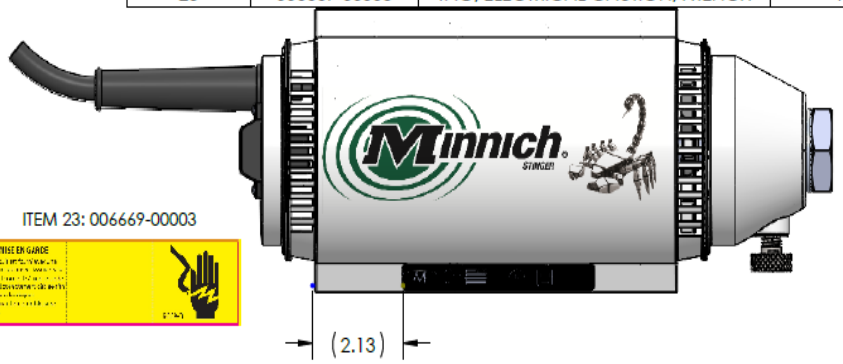
DRAWING NUMBER: A13651-00040

DRAWN BY:	TP
CHECKED BY:	RJ
APPROVED BY:	AEB
ORIG DATE:	4/22/2022
REV. LEVEL	-

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	006215-1.250	5/16-18 X 1-1/4 SHCS ZINC	8
2	7976-4	ADAPTER, MINNICH CASING	1
3	013565-00000	NO. 4-20 X 3/8 TORX THREAD FORMING	4
4	013572-00000	T20 THREAD-FORMING SCREW	14
5	013574-00000	5/16 BELLEVILLE WASHER	8
6	402-00-02-00003	DRIVER ADAPTER HOUSING	1
7	402-00-02-00004	ADAPTER RETAINER HOUSING	1
8	402-00-02-00006	CORD SET - STRAIN RELIEF	1
9	402-00-02-00007	ROCKER SWITCH	1
10	402-00-02-00008	RETRACTABLE PLUNGER W/KNOB	1
11	402-00-03-00001	END CAP	2
12	402-00-03-00002	DEFLECTOR	2
13	402-00-03-00003	CFV TIE ROD	4
14	402-00-03-00004	SWITCH PLATE	1
15	402-00-03-00005	TUBING INSERT	8
16	402-00-06-01000	MINNICH SHOULDER STRAP	1
17	402-01-00-00001	CVS SHELL LH	1
18	402-01-00-00002	CSV SHELL RH	1
19	402-01-01-00000	CSV 115V POD	1
20	402-01-02-00000	CSV PCB ASSEMBLY	1
21	402-01-03-00000	115V CSV SN TAG	1
22	006669-00002	TAG; ELECTRICAL CAUTION; ENGLISH	1
23	006669-00003	TAG; ELECTRICAL CAUTION; FRENCH	1



ITEM 23: 006669-00003



Drilled Hole Size	Tolerance
.0135 THRU .125	+.004/-.001
.1260 THRU .250	+.005/-.001
.2510 THRU .500	+.006/-.001
.5010 THRU .750	+.008/-.001
.7510 THRU 1.00	+.010/-.001
1.001 THRU 2.00	+.012/-.001

These dia and tolerances are for holes drilled with drilling machines such as mills or lathes, drill presses, or widespot operations. The following are standard tolerances for general machine work and apply in all cases except where greater or lesser accuracy is required by design and noted.

TOLERANCES (EXCEPT AS NOTED)
.X ± .060
.XX ± .030
.XXX ± .005
X/X ± 1/16"
< ± 1°

Dimension in accordance with ANSI Y14

#

RAW MATERIAL/ MATERIAL | STOCK SIZE

MINNICH MFG. CO., INC.

THE INFORMATION SHOWN ON THIS DRAWING IS CONFIDENTIAL TO MINNICH MFG. & OUR CUSTOMERS & SHALL NOT BE DISTRIBUTED TO THIRD PARTIES WITHOUT WRITTEN PERMISSION OF MINNICH MFG.

DRAWN BY: RJ

DO NOT SCALE DRAWING

CHECKED BY: DJC

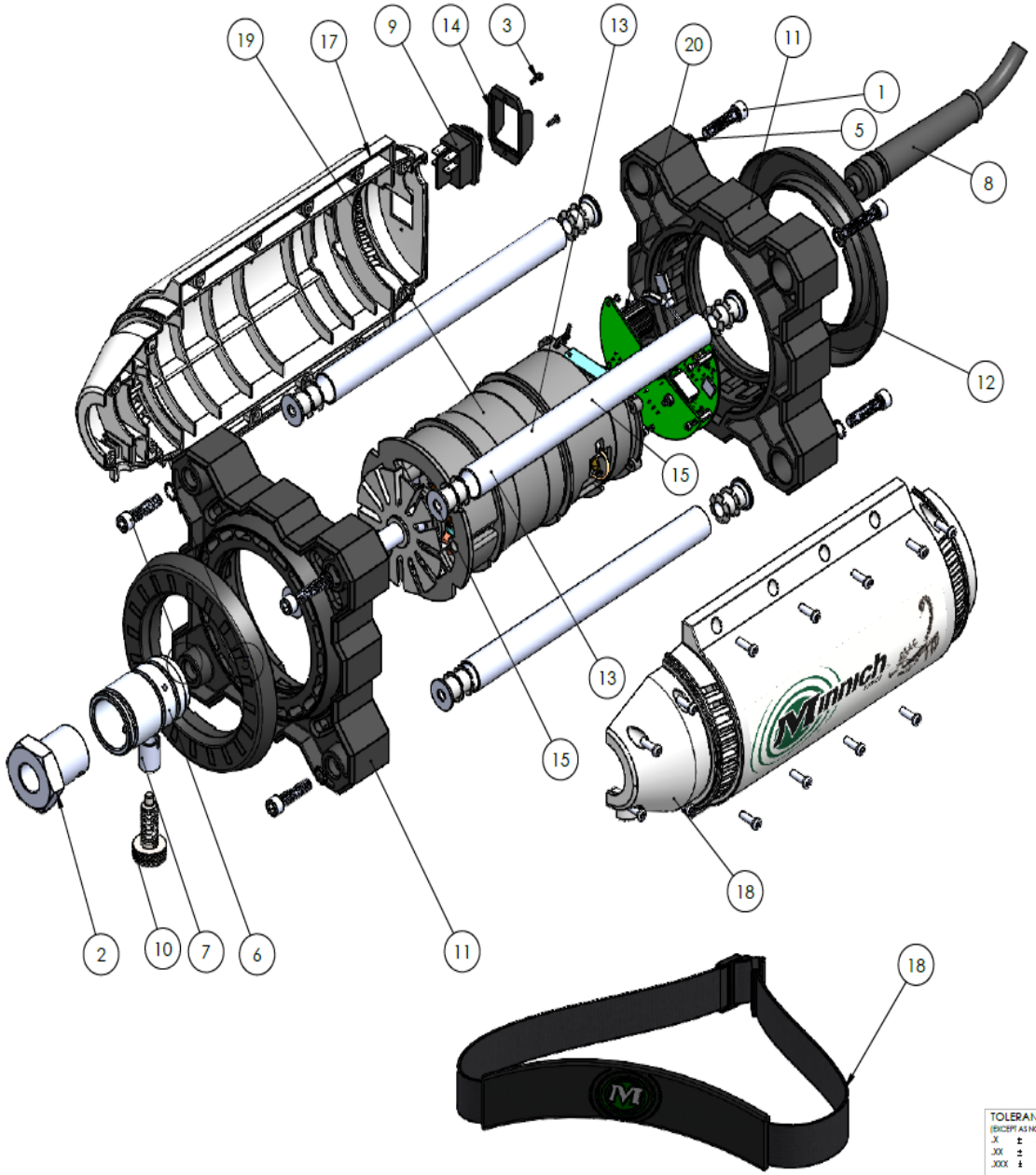
APPROVED BY:

TITLE: 115V CSV

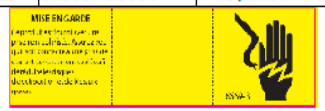
ORIG DATE: 11/30/18

FIXTURE NO. | LOCATION | ROUTING NO. | DRAWING NUMBER: 402-01-00-00000

REV. LEVEL -



ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	006215-1.250	5/16-18 X 1-1/4 SHCS ZINC	8
2	7976-4	ADAPTER, MINNICH CASING	1
3	013565-00000	NO. 4-20 X 3/8 TORX THREAD FORMING	4
4	013572-00000	T20 THREAD-FORMING SCREW	14
5	013574-00000	5/16 BELLEVILLE WASHER	8
6	402-00-02-00003	DRIVER ADAPTER HOUSING	1
7	402-00-02-00004	ADAPTER RETAINER HOUSING	1
8	402-00-02-00006	CORD SET - STRAIN RELIEF	1
9	402-00-02-00007	ROCKER SWITCH	1
10	402-00-02-00008	RETRACTABLE PLUNGER W/KNOB	1
11	402-00-03-00001	END CAP	2
12	402-00-03-00002	DEFLECTOR	2
13	402-00-03-00003	CFV TIE ROD	4
14	402-00-03-00004	SWITCH PLATE	1
15	402-00-03-00005	TUBING INSERT	8
16	402-00-06-01000	MINNICH SHOULDER STRAP	1
17	402-01-00-00001	CVS SHELL LH	1
18	402-01-00-00002	CSV SHELL RH	1
19	402-01-01-00000	CSV 115V POD	1
20	402-01-02-00000	CSV PCB ASSEMBLY	1
21	402-01-03-00000	115V CSV SN TAG	1
22	006669-00002	TAG; ELECTRICAL CAUTION; ENGLISH	1
23	006669-00003	TAG; ELECTRICAL CAUTION; FRENCH	1



ITEM 23: 006669-00003



ITEM 22: 006669-00002



ITEM 21: 402-01-03-00000

TOLERANCES (EXCEPT AS NOTED) .X ± .060 .XX ± .030 .XXX ± .005 X/X ± 1/16" < ± 1°	Dimension in accordance with ANSI Y14	RAW MATERIAL/ MATERIAL	STOCK SIZE
		MINNICH MFG CO. INC. THE INFORMATION SHOWN ON THIS DRAWING IS CONFIDENTIAL TO MINNICH MFG. & OUR CUSTOMERS & SHALL NOT BE DISTRIBUTED TO THIRD PARTIES WITHOUT WRITTEN PERMISSION OF MINNICH MFG.	DRAWN BY: RJ
		DO NOT SCALE DRAWING	CHECKED BY: DJC
		TITLE: 115V CSV	APPROVED BY:
			ORIG DATE: 11/30/18
FIXTURE NO.	LOCATION	ROUTING NO. DRAWING NUMBER: 402-01-00-00000	REV. LEVEL -

FUNCTION (APP) - APPLE IOS

The Control Speed Vibrator (CSV) is a Bluetooth operated tool. The tool needs to be paired with a smart phone that has a downloadable APP. The default RPM for the tool is 4,000 RPM. Any changes to the speed will require the Minnich Monitor App. To get started follow the instructions below for an Apple iOS device.



Using your smart phone camera scan the Qr code on the back end of the vibrator motor.



Tapping the Gray text box at top of phone will take you to the CSV page on the Minnich website.



Visit the Apple App Store.



Download the Minnich Monitor App.



new users, sign up. If already registered, log in.



On the sign up page, fill out information, agree to all terms at bottom, and click register.



This will return you to login page. Log in using your new password.



Click on scan.

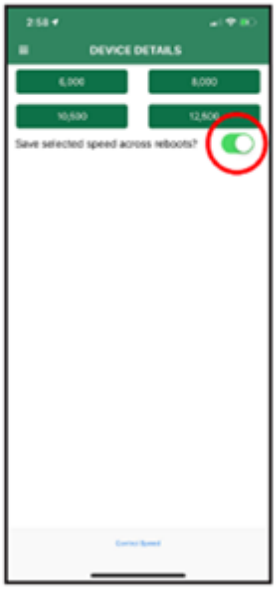
ANDROID



your CSV serial number will appear, then click on the serial number.



This is your speed control page, simply select the speed you want to run the vibrator.



This switch allows the default to be changed from the preset default speed of **4,000** to your selected speed.

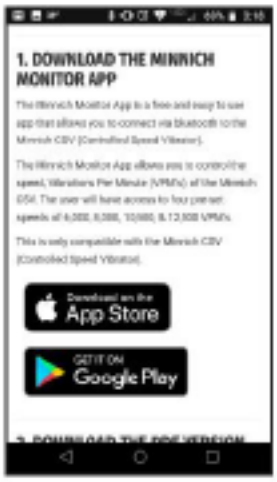
The Control Speed Vibrator (CSV) is a Bluetooth operated tool. The tool needs to be paired with a smart phone that has a downloadable APP. The default RPM for the tool is **4,000** RPM. Any changes to the speed will require the Minnich Monitor App. To get started follow the instructions below for an Android device.



Using your smart phone camera scan the QR code on the back end of the vibrator motor.



Tap the link symbol at the top left of phone will take you to the CSV page on the Minnich website.



Visit the Google Play App.

FUNCTION (APP) CONT'D - ANDROID



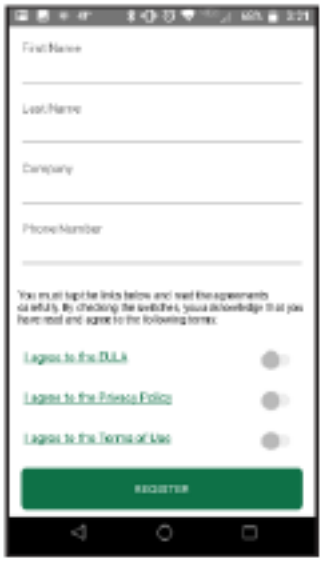
Download the Minnich Monitor App.



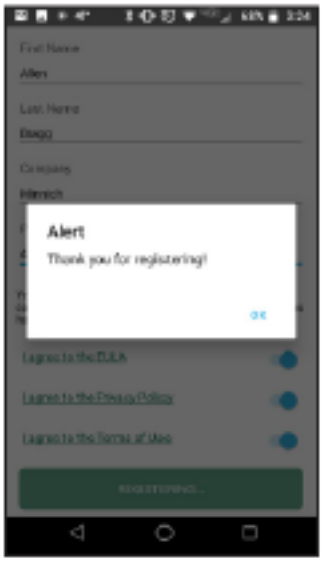
New users, sign up. If already registered, log in.



On the sign up page, fill out information, agree to all terms at bottom, and click register.



This will return you to login page. Log in using your new password.



Confirmation.

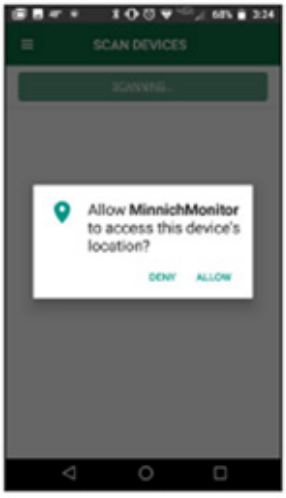


Tap SCAN.

FUNCTION (APP) CONT'D - ANDROID



This switch allows the default to be changed from the preset default speed of **4,000** to your selected speed.



Allow access.



Your CSV serial number will appear. Tap serial number.



This is your speed control page, simply select the speed you want to run the vibrator.

NOTICE

Δ DO NOT adjust the speed in Custom Speed settings, This is set at the correct testing speed from the factory (4,000VPM).

NOTICE

Δ Make sure that the string pot cable is free from debris at all times. Clean it off after every test to ensure proper testing results.

MINNICH

Supplier warrants to Customer that the Services shall be provided in a workmanlike manner and that the Goods shall be free from defects in material and workmanship at the date of shipment from Supplier's facility. This warranty shall not run to any person other than Customer.
All claims under this warranty must be made in writing and delivered to Supplier prior to the expiration of one (1) year after the Goods have been delivered (or, if applicable, within one (1) year after the Services have been performed) or be forever barred. Supplier will repair or replace Goods or parts recognized and acknowledged by Supplier as being defective at the time of delivery without charge. However, Supplier will bill Customer for Goods and/or Services not covered by the warranty, including travel expenses incurred while performing warranty service calls. EQUIPMENT, COMPONENTS OR OTHER GOODS FURNISHED THAT ARE NOT MANUFACTURED BY SUPPLIER ARE ONLY COVERED TO THE EXTENT OF THE ORIGINAL MANUFACTURER'S WARRANTY, WHICH MAY VARY FROM THE ABOVE. Further, the above warranty shall not apply to any hardware or software that has been repaired or altered without Supplier's written permission by anyone other than Supplier's personnel. The foregoing states the sole and exclusive remedy for any breach of warranty or for any other claim based on any defect in, or nonperformance of, the Goods or Services, whether based upon contract, warranty, negligence, tort (including strict liability) or otherwise.
NO EXPRESS WARRANTIES AND NO IMPLIED WARRANTIES, WHETHER OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR WEAR CAPACITY, OR OTHERWISE, SHALL APPLY TO THE GOODS AND SERVICES. SUPPLIER SPECIFICALLY DISCLAIMS AND EXCLUDES ALL OTHER EXPRESS AND IMPLIED WARRANTIES. NO WAIVER, ALTERATION, ADDITION OR MODIFICATION OF THE FOREGOING SHALL BE VALID UNLESS MADE IN WRITING AND SIGNED BY AN EXECUTIVE OFFICER OF SUPPLIER. IN NO EVENT WILL SUPPLIER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

WHAT IS NOT COVERED

This Limited Warranty does not cover any damage, deterioration or malfunction resulting from normal wear or tear, or any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This Limited Warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Minnich to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product.

WHAT IS COVERED

This limited warranty ("Limited Warranty") covers manufacturing defects in materials and workmanship of a product.

WHO IS COVERED:

Only the original purchaser of this product is covered under this Limited Warranty. This Limited Warranty is not transferable to subsequent purchasers or owners of this product. The product must have been purchased directly from Minnich or from an authorized Minnich reseller.

ORDER VIA INTERNET!

Order Online:
https://www.minnich-mfg.com/login

- View parts
- Order Parts
- Print specific information
- If you don't have a login give us a call.

ORDER VIA PHONE!

Contact us at:
419-903-0010

WE ACCEPT THE FOLLOWING CARDS!

NON-DEALER AND INTERNATIONAL COSTUMERS:

Contact Minnich Manufacturing through the following number to locate a dealer near you.
(419-903-0010)

NOTICE

All orders are treated as Standard Orders and will ship the same day if received prior to 3PM EST