Setup Guide

Orbital Shaker for PIPETMAX®

Part Number 32000199

Familiarize yourself with operation of PIPETMAX® by reading the *PIPETMAX® 268 User's Guide*.

Familiarize yourself with use of Gilson TRILUTION® micro software. Select the "?" icon to access the help documentation within the software. Ensure that you are using the most recent version of the software (refer to **http://www.gilson.com/en/Pipette/Products/75.290/Default.aspx?d=583#.V7My6vkrJaQ**)

Follow all manufacturers' instructions for safe use of equipment, reagents, and materials.

The content of this setup guide is intended to be a general information resource in regard to the subject matter covered, but is provided solely on an "as is" basis without warranty. Gilson may modify this document at any time; modifications will be posted to the website. You are responsible for verifying information before relying on it. Please see the appendix for links to additional reference materials.

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Technical literature related to PIPETMAX® is available at **www.gilson.com**.

E-mail Gilson technical support (**techsupport@gilson.com**) if you have questions on use of this system.

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Product Overview

The orbital shaker is an accessory for use with Gilson PIPETMAX®. This document describes the components that are shipped with the orbital shaker, how to install the shaker on PIPETMAX®, how to establish the serial device connection, and finally run a protocol using TRILUTION® micro software control.

The orbital shaker for PIPETMAX® can be controlled within the following parameters:

- Speed: 60–3570 rpm
- Acceleration: 0–10 sec
- Direction: Clockwise or Counterclockwise
- Orbital motion: 1 mm

Different labware will require different settings for shaking speed and acceleration. We recommend five seconds as a typical setting for acceleration. The table below shows some typical values for velocity.

Example Labware	*Recommended Velocity Range (rpm)*
1.5–2.0 mL tubes	500–1500
96-well plates	1000–3000
384-well plates	1000–3570

Please contact **techsupport@gilson.com** for assistance with protocols to control the orbital shaker.

Contents of Package (Part Number 32000199)

*Not shown - Converter, USB to Serial Single Port

Item	*Image*	*Description*
Orbital Shaker		The orbital shaker is provided with a custom base plate enabling installation on the PIPETMAX® removable tray, as well as a 3 ft igus® cable carrier for containing the power and data cords.
Power Cord	 	100–240 VAC 50/60 Hz power adapter, 24 VDC 1.5 A output, CE approval, US plug 6 foot cord

Item	Image	Description
Data Cable		6 foot RJ-11 4-pin telephone cable, straight-through configured, with RJ-11 to 9-pin D-type serial cable connector module
USB Drive		USB drive provided by BigBear Automation. Includes product line manuals and other reference information related to the shaker.
USB to Serial Converter		USB to RS232 DB9 Serial Adapter Cable required for use with orbital shaker and PIPETMAX® (using tablet as controller). Subject to CSP terms and conditions.
Documentation		Paper copy of the Burn-In, Test and Certification

Other Required Items

Description	Part Number	Qty	Notes
PIPETMAX® 268 with cover cutouts	32100001	1	Cover cutouts are required for use of the orbital shaker.
TRILUTION® micro installed on touchscreen tablet*	32000321	1	Run software for controlling PIPETMAX®.
PIPETMAX® 268 Tray 384 Well	32000091	1	Removable tray with nine bed positions. Includes clips for securing microplates.
PIPETMAX® 268 ON BED DEVICE CABLE GUIDE	32000247	1	The On-Bed Device Cable Guide allows tubes and cables from the shaker and circulating temperature blocks to safely exit the instrument. One On-Bed Device Cable Guide can support up to two devices and is required for any PIPETMAX® using these devices.
Protocol (SQLITE file) with instructions for operation of shaker	custom		SQLITE files are accessed via TRILUTION® micro software and provide the instructions for controlling PIPETMAX® and the orbital shaker.
MAX8x200 Pipette Head+	FC10021	1	8-channel head (20-200 µL) for PIPETMAX®.
MAX8x20 Pipette Head+	FC10022	1	8-channel head (1-20 µL) for PIPETMAX®.
Tip storage riser for PIPETMAX®	32000177	1	Riser for off-bed tip disposal. Includes on-deck waste chute and under-instrument waste bin.

* If a laptop or tower PC with RS-232 port is used instead of a tablet to interface with PIPETMAX®, part numbers 32000321 and 21014736-CSP are not required, but rather, TRILUTION® micro for PC (part number 32000320) is required.

+ The user may require one or two pipette heads, depending on the application. At this time, 8x20, 8x200 and 1x1000 heads are available for PIPETMAX®.

Installation of the Orbital Shaker on PIPETMAX®

1. Remove shaker from the box and place it on a level surface.
2. Remove the top cover of the igus® cable assembly. Plug in the communication cable and power cable into the orbital shaker and route the cables through the igus® assembly as shown. A video showing assembly and disassembly of an igus® cable is available at **http://www.igus.com/wpck/3278/mont_Zipper**.

Figure 1: Cables routed and igus® cover installed

3. Install On-Bed Device Cable Guide (part number 32000247) underneath the front of PIPETMAX®.
4. Using a screwdriver, detach, and set aside the removable cover cutout from the appropriate side of the PIPETMAX® cover (as determined by the bed layout in the protocol).

5. Place orbital shaker in the front left or front right position (corresponding to the position with the open cover cutout). Fasten the orbital shaker to the PIPETMAX® removable tray using four of the thumbscrews provided with PIPETMAX®.

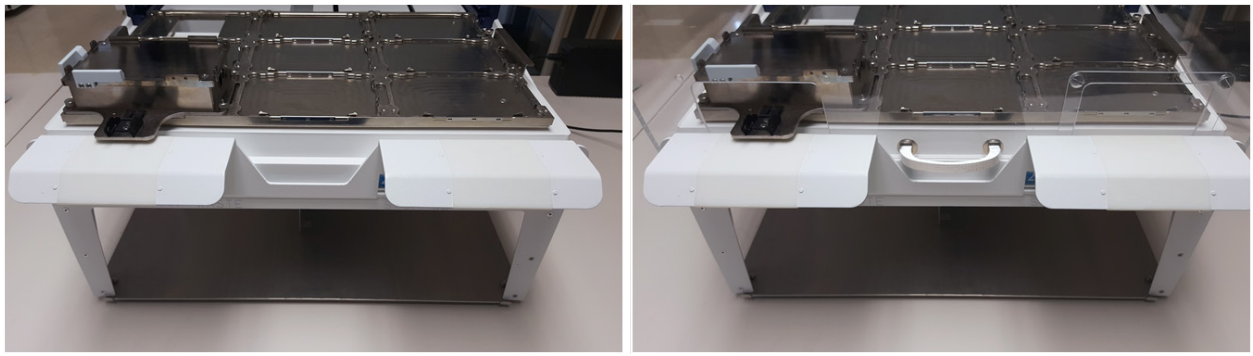


Figure 2: The igus® cable (not shown) routes through the cover cutouts in the PIPETMAX® hood. The figure shows the hood open (left) and hood closed (right).

6. Power on PIPETMAX®. Power on the tablet and log in to TRILUTION® micro. Then plug in the power to the orbital shaker and connect the orbital shaker to PIPETMAX® using the RJ-11 to 9 pin and 9 pin to USB adapters.

NOTE	It is important to establish communication between PIPETMAX® and the tablet (or PC) before connecting the shaker to the system. When powering down, disconnect the shaker from PIPETMAX®, make sure the lid of the instrument is closed, and follow the shutdown procedure on the tablet before powering off PIPETMAX®.

Software Control

TRILUTION® micro

Serial Device Discovery

In TRILUTION® micro, navigate to the Serial Device Discovery screen: **Home > Settings > Serial Devices** and then select the shaker from the drop-down menu next to **Configuration name**. The settings will autopopulate with the exception of the **Com port** setting. The available com ports will vary by computer, but one will automatically assign to the shaker when it is connected to the tablet or another PC.

Select one of the available **Com port** options from the drop down menu.

Click **Send** to send a shaker command through the selected Com port. A command of "Z" is sent by default. This command tells the shaker to return its name, which ensures that the selected com port is the correct com port for communication with the shaker.

If no text is returned in the **Response** box after sending the command, select another com port and repeat the command until a response of "HT-91100" is shown.

If the Response entry shown is not "HT-91100," repeat the command and/or select another com port.

Note that plugging the shaker into a different USB location may change its com port. In general, connecting and disconnecting the shaker from the same USB port and/or power cycling the tablet should not affect the com port.

When you see the correct **Response** entry, as shown in the image, record the name of the **Com port** entry that is selected. In this case, it is named "COM4." When setting multiple shakers up at the same time, plug one in first and complete this test, then repeat the test with each additional shaker, connecting them one at a time and skipping previously used com ports. Alternatively, sending a command of "F" will make the shaker on the current com port orbit briefly and home, so it can be identified visually.

You can also experiment with the shaker in the Serial Device screen by sending it other commands. The full command set is included in Appendix I.

Running a Protocol

You can now run your PIPETMAX® protocol with the shaker.

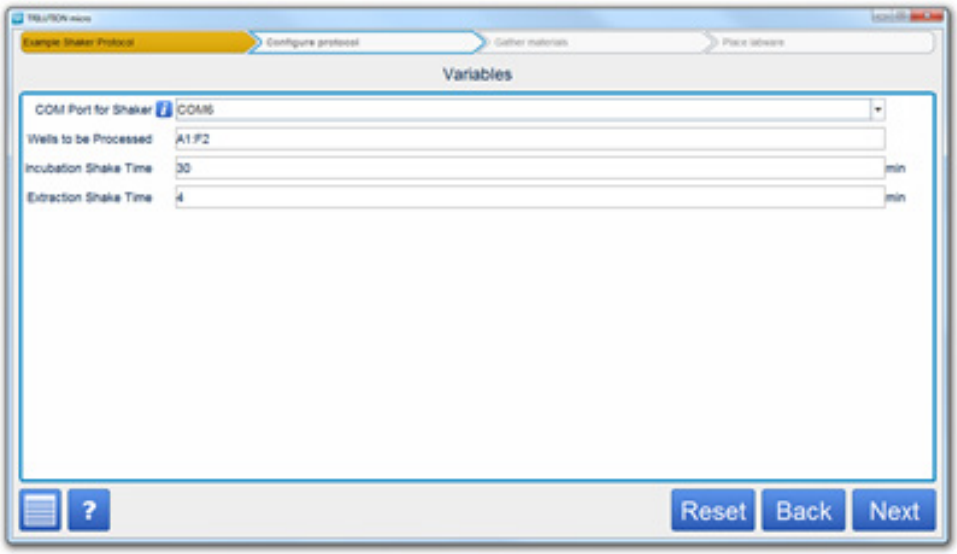
From the TRILUTION® micro home screen, select **Run/manage protocols**.

(If you have not yet imported the protocol, select **Manage protocols**, then select **import**, navigate to the file location, select the file, select **open**, and then click the home button to return to the previous screen. Select **Run a protocol**.

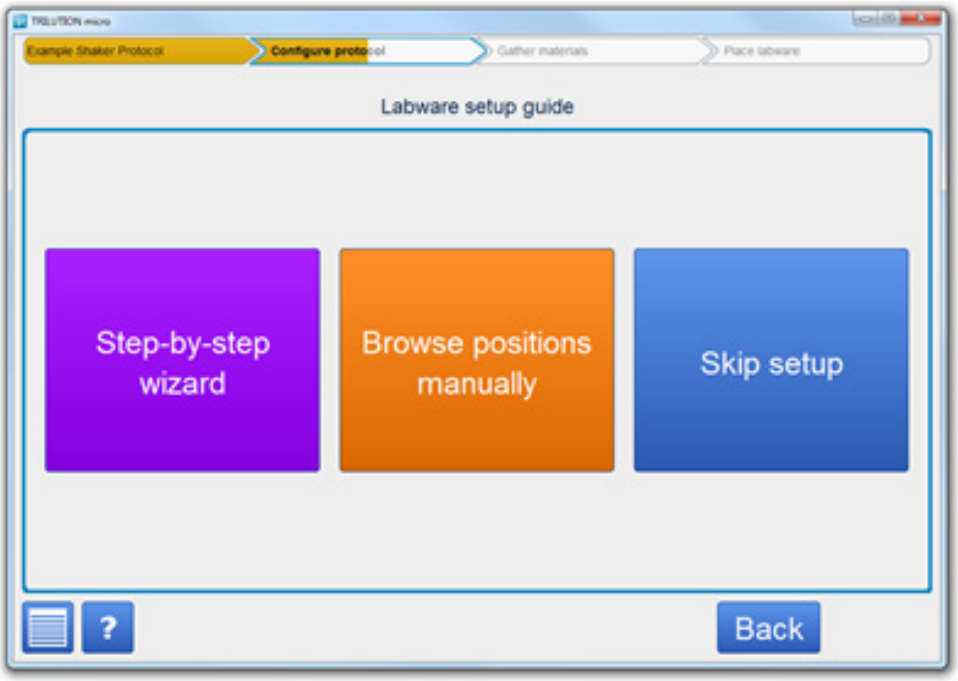
Highlight the protocol to run, and then click **Next**.

The Variables screen for your protocol will be displayed. (Depending on the protocol, the choices may differ from the ones in this illustration).

Enter the name of the **Com port** entry from the **Serial Device** screen as the name of the COM Port for Shaker (The name of the variable for **Port name** may vary slightly from what is illustrated here).



Select **Next**, then follow the step-by-step wizard to complete protocol setup.



Troubleshooting

Confirm that PIPETMAX® is properly installed and aligned. Refer to the *PIPETMAX® 268 User's Guide* for instructions.

Ensure that the removable tray and all plates, racks, accessories and tips are properly seated on the instrument.

Remove tips from the tip waste bin during all incubation steps as needed to prevent tip waste bin overfilling.

Only Gilson PIPETMAN® DIAMOND filter tips should be used with PIPETMAX®.

For assistance with questions relating to PIPETMAX® operation, contact Gilson Technical Support (**techsupport@gilson.com**).