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SWIFT 6.0 FLOW METER OPERATION MANUAL

SWIFT 6.0-9800 REV A

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1 INTRODUCTION

1.1 About This Manual

This document is organized with the most important information toward the front of the manual. All users should read and understand the sections on setup, operation, and field audits. Toward the back are sections that provide in-depth information on subjects such as diagnostics and accessories. These sections should be consulted as needed.

This manual is periodically revised for maximum accuracy and to incorporate new features or updates. User feedback is welcome. The latest electronic version of this manual is available at: https://metone.com/products/swift-6-0-flow-meter/.

1.2 Technical Service

Should support still be required after consulting the documentation, contact one of the expert Met One Instruments, Inc. Technical Service representatives during normal business hours of 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday. In addition, technical information and service bulletins are often posted on our website. Please contact us and obtain a Return Authorization (RA) number before sending any equipment back to the factory. This allows us to track and schedule service work and to expedite customer service.

Contact Information:	Tel: + 541 471 7111 Fax: + 541 471 7115 Web: http://www.metone.com Email: service@metone.com	**Address:**	Met One Instruments, Inc. 1600 Washington Blvd Grants Pass, Oregon 97526 U.S.A.

Please have the instrument serial number available when contacting the manufacturer. On most models manufactured by Met One Instruments, it will be located on a silver product label on the unit, and also printed on the calibration certificate. The serial number will begin with a letter and be followed by a unique five digit number such as U15915.

1.3 Swift 6.0 Flow Meter

Figure 1-1 Swift 6.0 Flow Meter

The Met One Instruments, Inc. Model Swift 6.0 is a multi-function Flow Meter specifically designed for accurate low-rate measurements. Its flow rate range is 0.1 to 6.0 liters per minute (LPM). The device's easy to read display shows Flow Rate, Flow Temperature and Ambient Pressure. Flow measurements are traceable to NIST standards and a certificate of calibration is provided with each unit. The Swift 6.0 comes complete with a portable kit carrying case, flow adapters and a power cable for USB charging.

1.4 Swift 6.0 Specifications

PARAMETER	SPECIFICATION
Flow Range	0.1 to 6.0 LPM
Flow Accuracy	±2% of reading or 0.05 LPM, whichever is greater
Display Resolution (Flow)	0.01 LPM
Display Units	LPM
Barometric Pressure Range	533 - 1033 mbar
Barometric Pressure Accuracy	±16 mbar
Display Resolution (Pressure)	0.1 mbar
Pressure Units	mbar, mmHg, kPa, in Hg, Pa
Temperature Accuracy	±1°C
Display Resolution (Temp.)	0.1°C
Temperature Units	C, F
DC Power	Internal Lithium-ion battery
Charging	USB-C
Serial	USB-C
Battery Life	10 hours
Driver	CP210X
Software	Swift Setup Software
OLED Display	White on Black, 128x64 Resolution
Display Parameters	Flow Rate, Temperature, Pressure, Battery Level
Weight	12 oz. (340.19g)
Size	2.75 in. wide x 3.75 in. height x 1.25 in. depth (6.985 cm x 9.525 cm x 3.175 cm)
Operating Temperature Range	-10°C to +50°C
Operating Humidity	0 to 100% Non-condensing

Specifications may be subject to change without notice.

2 SETUP

Use the following information to correctly assemble, configure, and deploy the Swift 6.0. There are no special precautions or handling concerns except for the normal level of care required for handling scientific equipment. Refer to the instructions and diagrams on the following pages.

2.1 Unpacking

Unpack the Swift 6.0 flow meter and accessories and compare them to the packing list to make sure all items are present.

Any damage incurred to the equipment during shipping are the responsibility of the carrier. If any damage to the shipment is noticed before unpacking, **a claim must be filed with the commercial carrier immediately**. Follow any special unpacking instructions provided by the carrier as all items are carefully removed from the containers and each component inspected. It is recommended to document and photograph all damaged packages and items before, during, and after unpacking them. Contact Met One Instruments (see section 1.2 of this manual) to arrange for any replacement items needed.

The normal instrument configuration is supplied with the following standard accessories:

Swift 6.0 Flow Meter includes
- Inlet Filter
- Inlet Filter Adapter
- USB Cable
- Flow Adapter
- Tubing
- Carrying case
- Calibration Certificate

The standard components for the Swift 6.0 are shown in Figure 2-1.

Figure 2-1 Standard Components for the Swift 6.0

Please keep all the special shipping items (box, foam packing material, etc.) used to ship the Swift 6.0. They should be re-used if the Swift 6.0 is to be transported (changing site locations, returning to the factory, etc.). Contact Met One Instruments (see section 1.2 of this manual) for replacement packing materials if necessary.

2.2 Instrument Assembly and Configuration

A Silicon Labs CP210x Driver for the USB connection must be installed before connecting to the USB Type C port on the Swift 6.0. This driver can be downloaded from our website at https://metone.com/software/. This only needs to be done once for each computer that is used with the flow meter.

Before operating the Swift 6.0 for the first time, it is recommended that the unit be fully charged. The battery is charged using the included USB cable. Insert the smaller USB C into the Swift 6.0 on the left side of the unit. The USB A end of the cable can connect to any USB port or connect to a standard outlet by using a USB wall adapter.

Complete the following steps to verify proper operation.
1. Slide the power switch up to turn on the power.
2. Observe the Met One Startup screen for 3 seconds, then the Product Model and Firmware screen for 3 seconds, then the Operate screen.

2.2.1 Assemble the Swift 6.0

Install the inlet filter onto the filter adapter. Insert the filter assembly into the "IN" labeled opening on the left side of the unit.

The "OUT" labeled opening on the right side of the unit is used to measure the flow of equipment with ½" outer diameter (O.D.) inlets. The smaller flow adapter fits inside this larger opening to measure a unit under test (UUT) with a smaller O.D. inlet. The supplied ⅛" I.D. tubing connects to this adapter and then the UUT to measure flow.
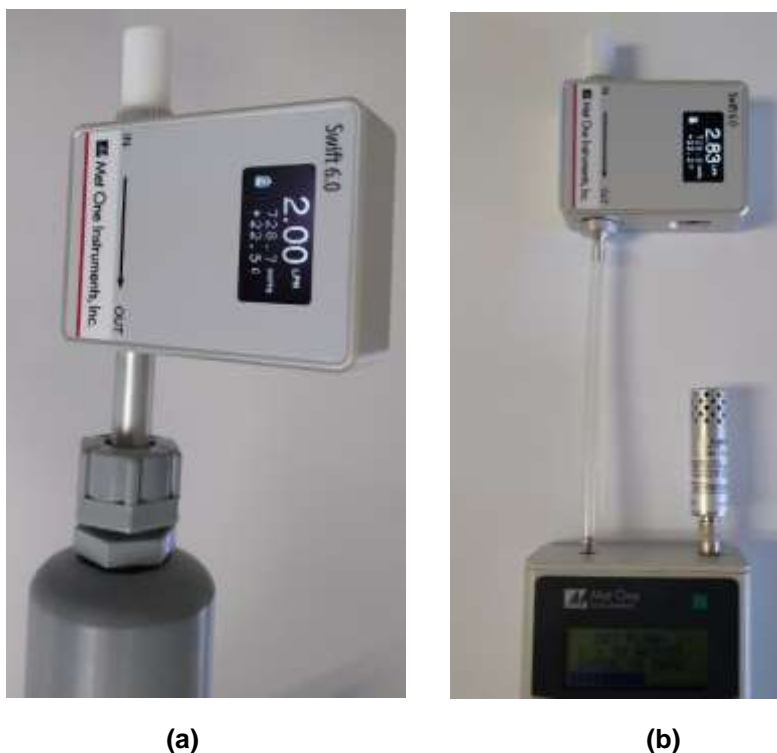

(a)   (b)

Figure 2-1: Flow measurements on UUTs with ½" O.D. inlet (a) and smaller inlets using ⅛" I.D. tubing (b)

2.2.2 Configuration Software

The Swift 6.0 features setup software to change the temperature and pressure units. The Swift Setup Software can be downloaded from our website at https://metone.com/software/.

Use the setup wizard to install the software on your computer. Connect the flow meter to the computer with the USB cable. Open the Swift Setup Software and select GET to load the device information.
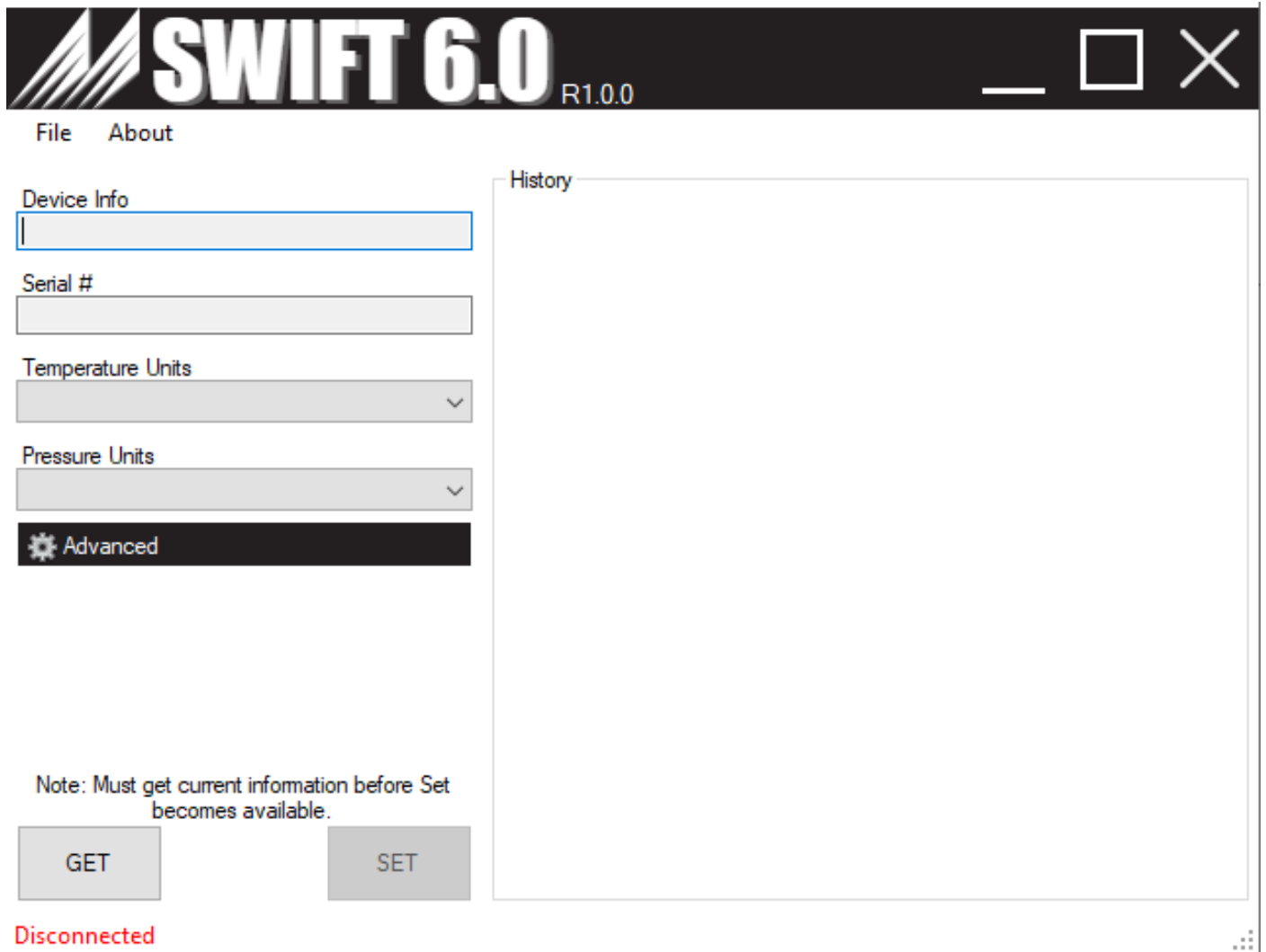

Figure 2-2 Swift Setup Software Opening Screen

Once the flow meter information is displayed, the temperature and pressure units can be changed using the drop down menus. Temperature can be displayed in C or F. Pressure can be displayed in mbar, mmHg, inHg, Pa, or kPa. Press set to change the displayed parameter.
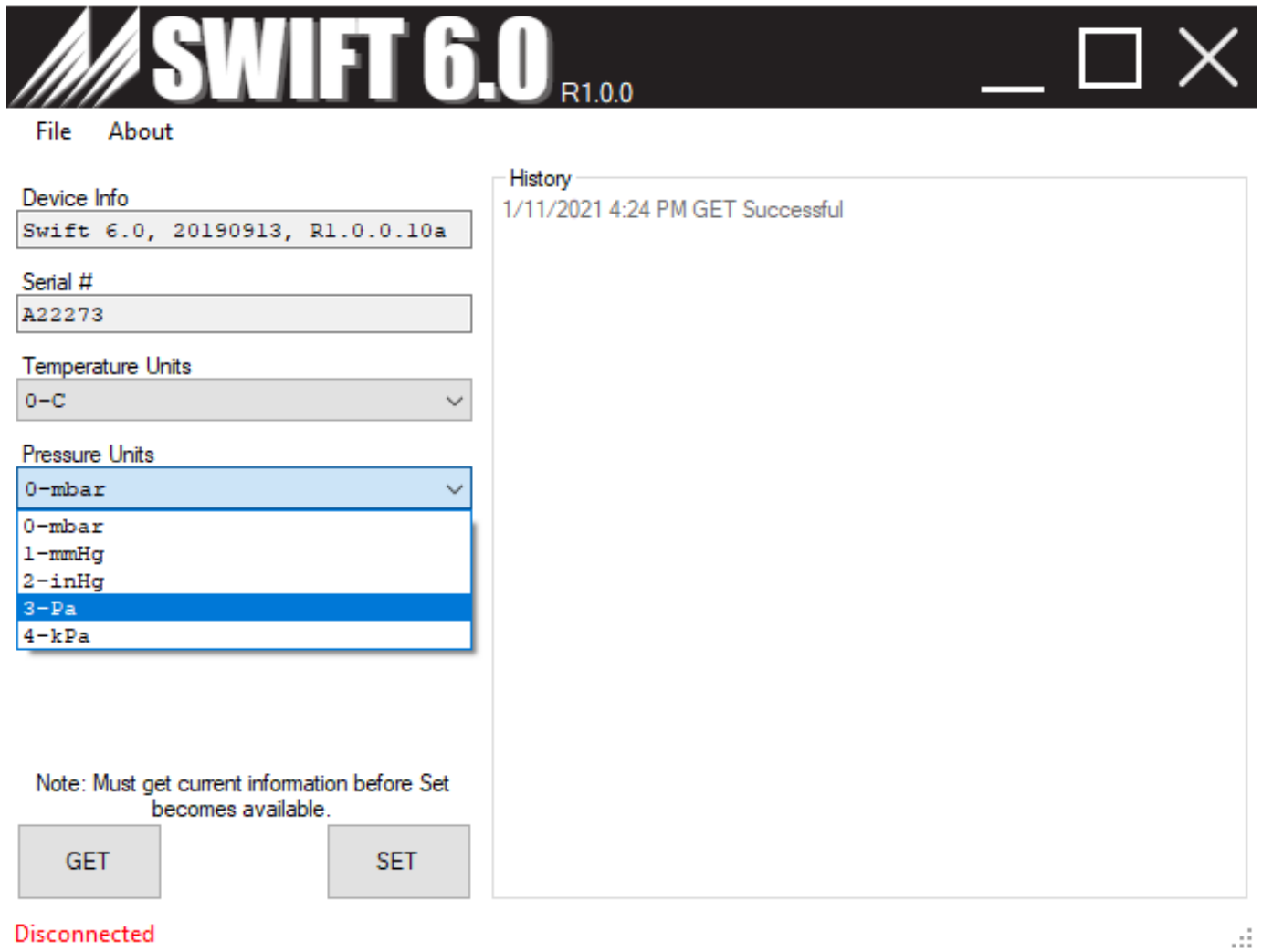

Figure 2-3 Swift Setup Software menu options

3 OPERATION

The Swift 6.0 is ready to begin sampling after a short boot up once the operate screen is displayed. Flow, pressure, and temperature readings are updated on the display once per second. A battery level indicator is located on the bottom left of the display.

3.1 Flow Measurement

Power the Swift 6.0 on before connecting to a unit to measure flow rate. The Swift 6.0 performs a zero flow measurement when first powered on. Ensure no air flow is passing through the flow meter before energizing the unit.

Connect the flow meter to the unit to be measured using the appropriate flow adapter. Refer to Section 2.2.1.

The flow reported on the top line of the display is in volumetric liters per minute (LPM).

3.2 Pressure Measurement

The absolute pressure is displayed on the middle line of the display. Default pressure units are mmHg. Displayed pressure units can be changed to mbar, inHg, Pa, or kPa using the Swift Setup Software.

3.3 Temperature Measurement

Temperature readings are measured in the flow chamber. Airflow must pass through the unit to obtain an accurate temperature reading.

Temperature is displayed on the bottom line of the display. Default temperature units are Celsius (°C). Displayed temperature units can be changed to Fahrenheit (°F) using the Swift Setup Software.

4 MAINTENANCE AND TROUBLESHOOTING

4.1 Recommended Periodic Maintenance Table

The table below shows the recommended interval for the regular maintenance, field checks, and service tasks.

Maintenance Item	Period
Factory Calibration	**12 months**
Replace Inlet Filter	**12 months**

4.2 Basic Problem and Cause/Solution Table

The following table contains information on some of the more common problems that may be encountered, and some steps to identify and remedy the problems. Met One Instruments welcomes customer suggestions for new items to include in this section of future manual revisions. If the solution cannot be found in the following table, then contact one of our expert service technicians for help in resolving the problem.

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Problem:	The flow meter will not turn on
Cause/Solution:	• The battery needs to be charged. o Connect the USB charging cable to the Swift 6.0 and appropriate power supply.

Problem:	The reported flow is significantly lower than expected

Cause/Solution:	• The flow meter was powered on while connected to a unit to test with flow engaged. The Swift 6.0 performs a zero flow measurement when first powered on.
	    o Remove the Swift 6.0 from the UUT and cycle power.
	• The flow meter was powered on in windy ambient conditions.
	    o Cover the zero filter inlet while power cycling the unit.

Problem:	The temperature does not match expected ambient conditions
Cause/Solution:	• Airflow must pass through the unit to obtain an accurate temperature reading. o Ensure the Swift 6.0 is connected to equipment with air flow.

5   SPARE PARTS and ACCESSORIES

5.1   Consumables, Replacement Parts, and Accessories

The following parts are available from Met One Instruments for maintenance, replacement, service, and upgrades. If unsure about a part, please contact the Service department and provide the serial number of the Swift 6.0.

General Accessories

Description	Part Number
USB CABLE, TYPE A MALE TO TYPE C MALE, 3 FEET	**502116**
SWIFT 6.0 CASE	**550536**
5 MICRON INLINE FILTER ELEMENT	**580345**
INLET FILTER ADAPTER	**83557**
FLOW ADAPTER	**83555**