

**Thermo Scientific Orion VERSA STAR™
Advanced Electrochemistry Benchtop Meter**
Reference Guide



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The specifications, descriptions, drawings, ordering information and part numbers within this document are subject to change without notice.

This publication supersedes all previous publications on this subject.

Thermo Scientific Orion VERSA STAR™ Advanced Electrochemistry Benchtop Meter

Table of Contents

Chapter 1	Introduction	1
Chapter 2	Meter Overview	3
	Meter Connections and Inputs	3
	<i>Connecting Electrode Arm</i>	3
	<i>Meter Inputs</i>	3
	<i>Connecting Power</i>	4
	Modules	4
	<i>Module Measurement Capabilities</i>	4
	<i>Module to Meter Connections</i>	4
	<i>Removing and Inserting Modules</i>	5
	<i>Electrode/Probe Attachments to the Module</i>	6
	Meter Display	7
	Meter Keypad	8
	Meter Maintenance	9
Chapter 3	Instruments Settings	11
Chapter 4	Data Storage and Review	13
	Data Storage Settings	13
	<i>Measurement Read Type</i>	13
	<i>Computer and Printer Export Settings</i>	13
	<i>Data Log Settings</i>	13
	Datalog Review	13
	Calibration Review	14
Chapter 5	Customer Services	15
	Troubleshooting Guide	15
	Meter Diagnostics	15
	Assistance	15
	Warranty and Registration	15
	WEEE Compliance	15
	Declaration of Conformity	16
	Meter Specifications	17
	Ordering Information	18

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Chapter 1 Introduction

Thank you for your purchase of the Thermo Scientific Orion VERSA STAR™ Advanced Electrochemistry Benchtop Meter. This meter allows for up to four channels to be configured in any combination through its modular design. Five modules are available: pH, pH/ISE, conductivity, dissolved oxygen or pH with LogR temperature technology. All five modules measure temperature and can be mixed and matched as needed and without the need to power off the meter.

The large, bright color display makes it easy to get the information and to use the advanced features. Display customization and information selection; multilingual interface; plain language prompts and easy-to-understand graphics make this meter easy to use. A RS232 communication port, two USB communication ports and two Orion Star stirrer ports are just some of the unique advantages of the Orion VERSA STAR.

Please read this reference guide thoroughly. Any use outside of these instructions may invalidate your warranty and cause permanent damage to the meter.

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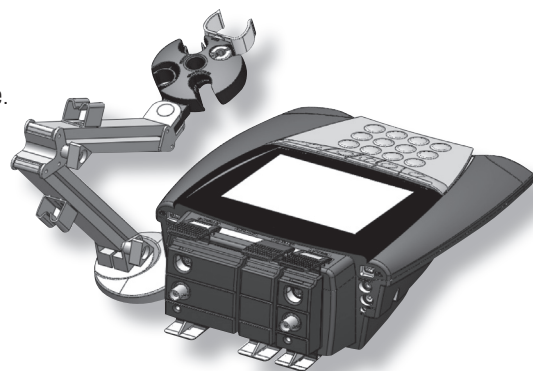
Chapter 2 Meter Overview

Meter Connections and Inputs

Connecting Electrode Arm

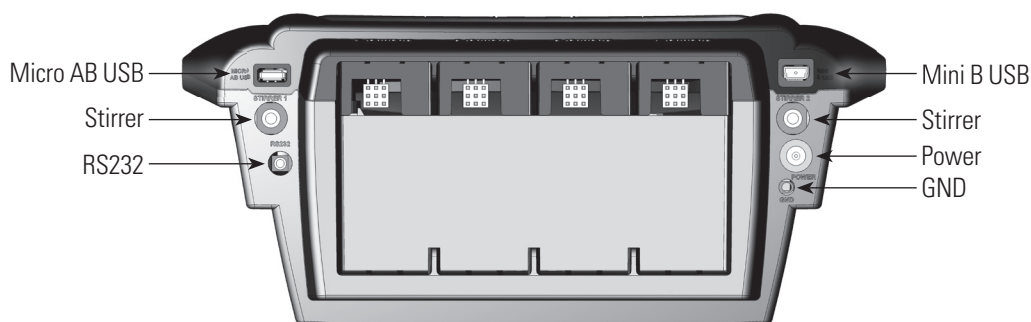
The electrode arms can be attached to either, or both, sides of the meter. (A separate weighted base, STARA-HB, is sold separately to use the arm without attaching to the meter.) Most kits contain one arm and some kits provide two arms. A second arm may be attached on the other side of the meter, through step 5, at the same time the first arm is being attached.

1. Open the box that contains the arm.
2. Turn the meter over on a clean, dry surface.
3. Remove the screw between the two circles on the base plate.
4. Align the base plate with the raised circles on the meter.
5. Replace the screw removed in step 3 to attach the electrode arm base to the bottom of the meter.
6. Turn the meter over.
7. Insert the electrode arm over the metal post.



Meter Inputs

Orion VERSA STAR Meter Back Panel with No Modules Attached



Connector	Description
Micro AB USB	For data output connection
Stirrer Jack	There are two stirrer jacks on the meter. Each one accepts the Orion Star Stirrer Probe (cat. no. 096019, available in select meter kits or sold separately). The probes can be used simultaneously and controlled separately by the meter through this connection. For further information on the stirrer probe assignments, refer to chapter 3 instrument settings.
RS232 Pin	Use with the included RS232 cable for communications and data transfer via RS232 port.
Mini B USB	Use with the included mini-USB-to-USB cable for communications and data transfer via USB. Allows bidirectional communication.
Power	See the following section titled "Connecting Power". Removal of power cord from the connector and reconnection reboots the meter.
Ground	Ground receptacle to reduce interference generated by other equipment.

Connecting Power

A universal power adapter, with US, EU, UK and China plug plates, is provided with the meter.

1. Select the appropriate plug plate for your power socket.
2. Slide the clear plastic cover off of the plug plate.
3. Slide the plug plate into the groove on the back of the power adapter.
4. Connect the power to the meter and to the power pin on the back of the meter.

Note: This adapter is specifically for use with the Orion VERSA STAR meter. Use of other power adapters could cause damage to the meter and will void any warranty.

Modules

The module(s) connected to the meter define the meter parameters. There are five available modules for use with the four meter channels.

Module Measurement Capabilities

The table below shows the module name, label on the top tab of the module and measurement modes.

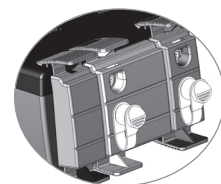
All measurements include temperature.

Module	pH	pH/ISE	RDO/DO	Conductivity	pH/LogR
Labeled As	pH	pH/ISE	RDO/DO	Cond	pH/LogR
Measurement Modes	pH	ISE	RDO (as % Sat or mg/L)	Conductivity	pH
	mV	pH	DO (as % Sat or mg/L)	Resistivity	Temperature from pH bulb (no ATC needed)
	RmV	mV	Temperature	TDS	mV
	ORP (Redox)	RmV		Salinity	RmV
	Temperature	ORP (Redox)		Temperature	ORP (Redox)
		Temperature			

Module to Meter Connections

Modules arrive installed in new Orion VERSA STAR meter and module packages.

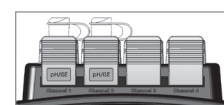
1. Modules pH, pH/ISE, Conductivity, RDO/DO each use one module slot.
2. pH/LogR module requires two module slots.
3. Open module slots are filled with blank modules.



Meter with blank, pH/LogR, and pH modules attached



Meter with blank, RDO/DO, Conductivity and pH/ISE modules attached



Modules labeled for easy identification

Removing and Inserting Modules

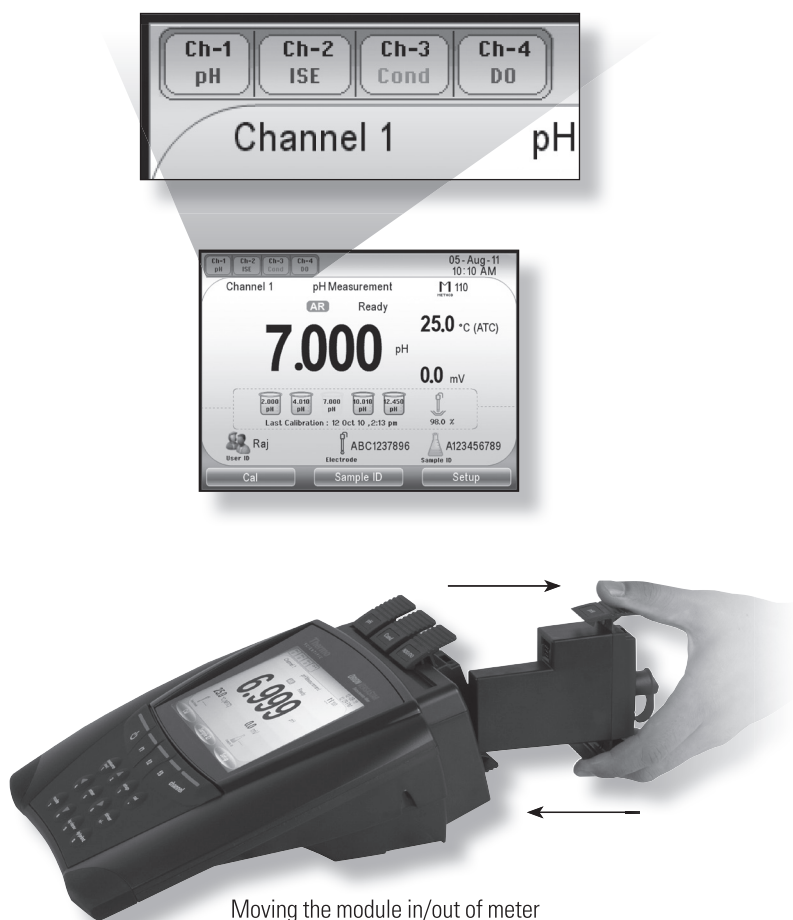
Easily change modules regardless of whether the meter is powered or unpowered.

Module Removal

1. With your thumb on the top (labeled) tab and your index finger on the bottom tab, squeeze the tabs towards each other.
2. Pull straight back to remove the module from the meter.
3. Powered meters will no longer display that channel's measurement.

Module Insertion

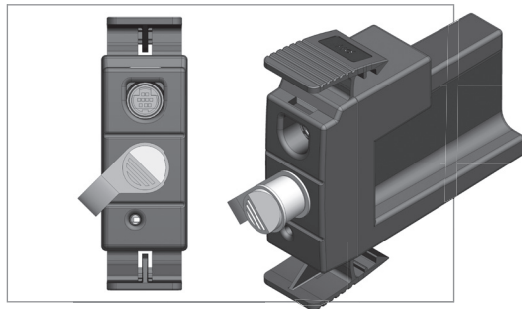
1. With your thumb on the top (labeled) tab and your index finger on the bottom tab, squeeze the tabs towards each other.
2. Push the module into an empty meter channel groove in the back of the meter.
3. Release the top and bottom tabs.
4. Powered meters will display channel information in top left of display.



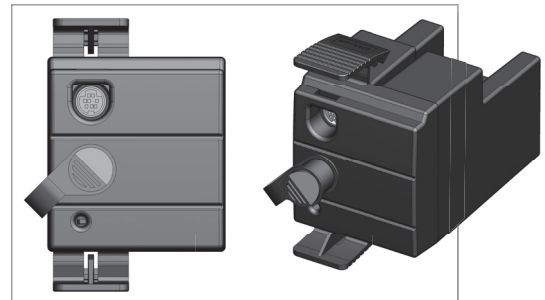
Electrode/Probe Attachments to the Module

The same electrodes and probes compatible with the Orion Star, Star Plus and Star A series meters can be used with the Orion VERSA STAR meter and module system.

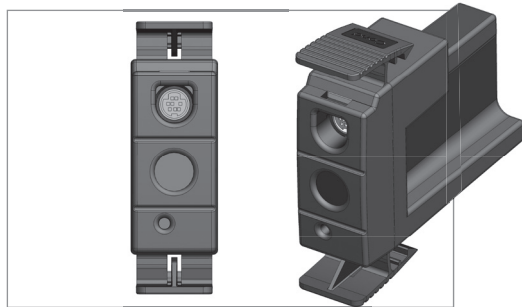
1. pH, pH/ISE electrodes connect to BNC; ATC probe connects to top 8 pin mini-DIN.
2. pH/LogR electrode connects to BNC and temperature taken from the pH bulb.
3. Conductivity probes connect to the top 8 pin mini-DIN.
4. RDO/DO probes connect to the top 9 pin mini-DIN and the probe type is automatically recognized.



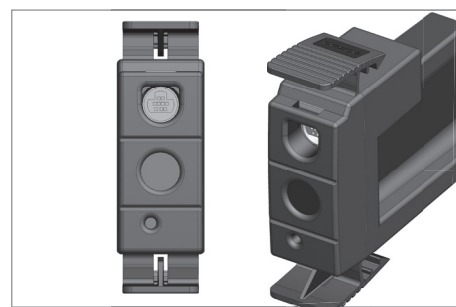
1. pH and pH/ISE Modules



2. pH/LogR Module



3. Conductivity Module

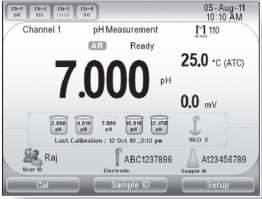
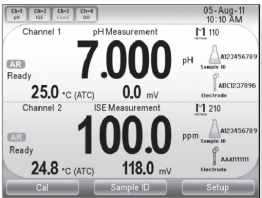
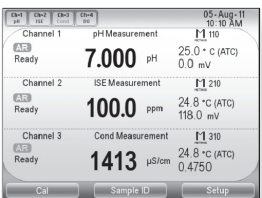
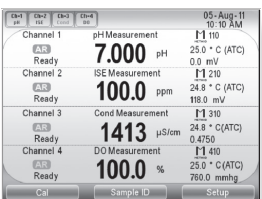


4. RDO/DO Module

For further information regarding each module, please see the specific reference guide for that module. The Reference Guide is on the CD included with the meter and also available at www.thermoscientific.com/water.

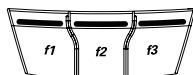
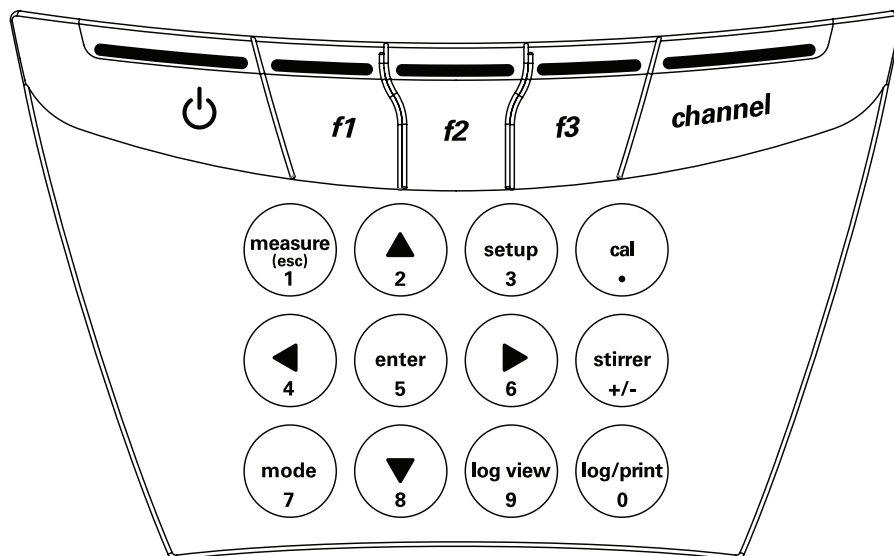
Meter Display

Pressing the **channel** key cycles through each individual channel. When multiple modules are connected, the **channel** keys shows each possible combination of simultaneous channel displays. To customize the channel key, refer to the next chapter - chapter 3 Instrument Settings.

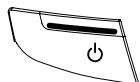
Format	View	Contains	Example Displays
Full screen	Single Channel (1, 2, 3, or 4)	Ch #, Measurement Mode, Method, Main measurement display with units, Temperature (units/type), Ready and Stability Indication, Sample ID, Electrode ID, Last Calibration (date, time, cal points, electrode slope)	
Half screen	Channels 1 & 2; 1 & 3; 1 & 4; 2 & 3; or 3 & 4	Ch #, Measurement Mode, Method, Main measurement display with units, Temperature (units/type), Ready and Stability Indication, Sample ID, Electrode ID Not shown: Last calibration data	
Third of a screen	Channels 1, 2 & 3; 1, 2 & 4; 1, 3 & 4; or 2, 3 & 4	Ch #, Measurement Mode, Method, Main measurement display with units, Temperature (units/type), Ready and Stability Indication Not shown: Last calibration data, sample ID, Electrode ID	
Fourth of a screen	Channels 1, 2, 3 & 4	Ch #, Measurement Mode, Method, Main measurement display, Temperature (units/type), Ready and Stability Indication Not shown: Last calibration data, sample ID, Electrode ID	

Secondary reading information shown per mode include mV for pH and ISE; offset mV for ORP and RmV; barometric pressure for RDO/DO and cell constant for conductivity, resistivity, salinity and TDS. For further information regarding the exact information displayed for each module, please see the specific reference guide for that module. The Reference Guide is on the CD included with the meter and also available at www.thermoscientific.com/water.

Meter Keypad



Press to perform the action shown above each key on the display.



Press to switch the meter to standby mode with screensaver or to return to active.



Press to view each individual channel, and when multiple modules are connected each possible combination of simultaneous channel displays. To customize the channel key, refer to the next chapter - chapter 3 Instrument Settings.



In the measurement mode, press begin a new measurement when in AutoRead mode. (AR icon shown and locks reading on display when stable.). Press to use as an escape key in most meter menus. In data fields, used to input the number 1.



Press to scroll up through lists of items. Also allows looping through the list (goes to last item after scrolling past the first item on the list). In data fields, used to input the number 2.



From the measurement mode, press to enter the setup menu. In data fields, used to input the number 3.









Press to scroll to the left of displayed information. In data fields, used to input the number 4.



Press to enter select options. In data fields, used to input the number 5.



Press to scroll to the right of displayed information. In data fields, used to input the number 6.

	Press to change the measurement mode of a channel. In data fields, used to input the number 7.
	Press to scroll down through lists of items. Also allows looping through the list (goes to first item after scrolling past the last item on the list). In data fields, used to input the number 8.
	Press to view data and calibration logs. In data fields, used to input the number 9.
	Press to manually log, print, or log and print a measurement, depending on your reading mode and data output settings. In data fields, used to input the number 0.
	Press to enter calibration mode. In data fields, used to input a decimal point.
	Press to turn on and off stirrer probe in continuous or timed reading modes.

Meter Maintenance

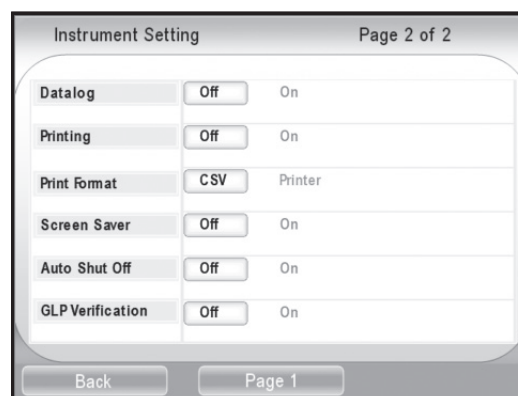
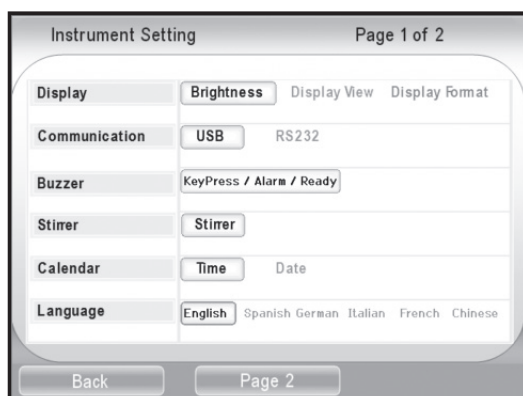
For routine meter maintenance, dust and wipe the meter with a damp cloth. If necessary, warm water or mild water-based detergent can be used. Meter maintenance can be performed on a daily, weekly or monthly basis, as required by operating environment. Immediately remove any spilled substance from the meter using the proper cleaning procedure for that spill type.

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Chapter 3 Instrument Settings

From the main screen of the meter, press **f3** to enter the Instrument Setup menu. The menus give the options to personalize the meter for your lab. The list of adjustable options are described in the table below.

Instrument Settings Options		
Level 1	Level 2	Level 3 (Default settings in bold)
Display	Brightness	1, 2, 3 , 4, 5
	Display View	Channel, Measurement Mode, Method, Stable, Temperature, Secondary Parameter, Calibration Details, User ID, Sample ID, Electrode Serial No: (Default all above set on)
	Display Format	Choose the screens displayed when the "channel" key is pressed (Default all display options set to on)
Communication	USB	To be enabled in future software update
	RS232	1200, 2400, 4800, 9600 , 19200, 38400, 57600, 115200
Buzzer	Key Press	On, Off
	Ready	On, Off
	Alarm	On, Off
Stirrer	Channels 1	Stirrer1, Stirrer2 : Speed 1, 2, 3 , 4, 5,
	Channels 2	Stirrer1, Stirrer2 : Speed 1, 2, 3 , 4, 5,
	Channels 3	Stirrer1 , Stirrer2: Speed 1, 2, 3 , 4, 5,
	Channels 4	Stirrer1 , Stirrer2: Speed 1, 2, 3 , 4, 5,
Calendar	Date	Factory setting
	Time	Factory setting
Language		English , Spanish, German, Italian, French, Chinese
Data Log		Off, On
Printing		Off , On
Print Format		CSV, Printer
Screen Saver		Off , On
Auto Shut Off		Off , On



For the setup options for each parameter, please see the specific module reference guide with that parameter.

The Reference Guide is on the CD included with the meter and also available at www.thermoscientific.com/water.

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Chapter 4 Data Storage and Review

Data Storage Settings

Measurement Read Type

The measurement read type determines when the meter sends measurements to outputs as selected in the setup menu and when properly connected to the meter. These are set individually for each channel. Refer to the individual module reference guide to set the measurement read type for each channel.

Computer and Printer Export Settings

Refer back to Chapter 3 Instrument Settings of this reference guide to:

- set the communication protocol
- turn on printing
- select the print format

Data Log Settings

Refer Chapter 3 Instrument Settings to turn on Data Log to enable data storage. Orion VERSA STAR Meters have a 2000-datalog capability.

Datalog Review

This option allows for stored data to be:

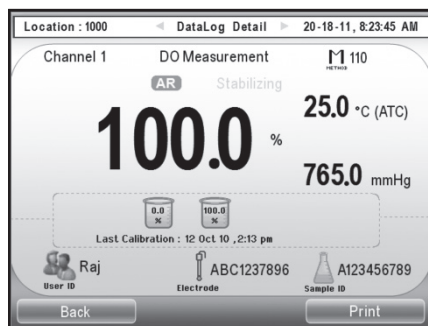
- reviewed
- printed individually, in a group or all
- deleted
- analyzed with general statistical information

The datalog will reflect a screen capture of all the information at the time of datalogging.

To review datalog information

1. Press **log view (9)** key.
2. Press **Select (f3)** key.
3. Follow prompts to review information.

Example Datalog View for DO Measurement



Calibration Review

This feature allows for review and printing of each of the last 10 calibrations for each parameter of the meter. The information will match the information recorded for that calibration.

To review calibration information

1. Press **log view (9)** key.
2. Press **right arrow (6)** key to select CalLog information and **down arrow (8)** to highlight the desired parameter.
3. Press **Select (f3)** key and follow the prompts.

Chapter 5 Customer Services

Troubleshooting Guide

Error	Recommended Actions
Meter displays "Module not detected . . . Plug in module to start Measurement" upon power up.	Insert a module into the meter. The meter will then display the main measurement screen for that parameter.
Module connection indicator does not show module.	Check that the module is connected fully to the meter.

Meter Diagnostics

This option in the setup menu allows for:

- **Factory Reset** – All meter settings reset to factory defaults. Data log, calibration log and methods deleted.
- **User Reset** – All meter settings rest to factory defaults. Data log, calibration log and methods retained.
- **Self Test** – This is performed automatically by the meter at each power up, but can be performed using this selection as well.
- **Stability Test** – For use with Orion VERSA STAR pH/Temperature or pH/ISE/Temperature module and pH, ISE or ORP electrode. Shows the mV per minute drift and noise of the electrode.
- **About Meter** – Provides information on the software revision and serial number of meter and modules.

To access the meter diagnostic options:

1. In the measurement mode, press **setup/f3**.
2. Use the arrow keys to highlight Diagnostics and press **select/f3**.
3. Follow the onscreen prompt to select the desired option and perform function.

Assistance

After troubleshooting all components of your measurement system, contact Technical Support. Within the United States call 1.800.225.1480 and outside the United States call 978.232.6000 or fax 978.232.6031. In Europe, the Middle East and Africa, contact your local authorized dealer. For the most current contact information, or the latest application and technical resources for Thermo Scientific Orion products, visit www.thermoscientific.com/water.

Warranty and Registration

To register your new meter and for the most current warranty information, visit www.thermoscientific.com/water.

WEEE Compliance



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the symbol above.

Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State and this product should be disposed of or recycled through them. Further information on compliance with these directives, the recyclers in your country, and information on Thermo Scientific Orion products that may assist the detection of substances subject to the RoHS Directive are available at www.thermoscientific.com.

Declaration of Conformity

Manufacturer: Thermo Fisher Scientific Inc.

Address: Ayer Rajah Crescent
Blk 55 #04-16/24
Singapore 139949
Singapore

Hereby declares that the following products:

Orion VERSA STAR Advanced Electrochemistry Benchtop Meters with Modules are rated 100 to 240 VAC, 50/60 Hz, 0.5A.

Equipment Class:

Measurement, control and laboratory
Orion Star A-series meters are EMC Class A

Conforms with the following directives and standards:

EN61326-1:2006

Electromagnetic Compatibility (EMC Directive)

Electrical equipment for measurement,
control and laboratory use - EMC requirements

EN61010-1:2001

Safety Standards

UL61010-1:2004

Safety requirements for electrical equipment for measurement,

CAN/CSA C22.2 No. 61010-1-04

control and laboratory use - general requirements



Cheow Kwang Chan
QA/Regulatory Manager

Place and Date of Issue:
12 December, 2011
Singapore

Meter Specifications



Meter Specifications		
Maximum number of modules		4
Methods		Up to 10 per channel
Datalogging	Memory	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, one timed reading
	Log Edit	Delete individual points, group of points or all
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz

Meter Operating Conditions		
Operating Ambient Temperature		5 to 45 °C
Operating Relative Humidity		5 to 85 %, non-condensing
Storage Temperature		-20 to +60 °C
Storage Relative Humidity		5 to 85 %, non-condensing
Pollution		Degree 2
Overvoltage		Category II
Weight	Meter	1150 g
	Module	150 g
Size		9.5 cm (H) x 24.0 cm (W) x 28.2 cm (D)
Regulatory and Safety		CE, TUV 3-1, FCC Class A
Power Rating		DC Input: 9VDC, 1A
Shock and Vibration		Vibration: shipping/handling per ISTA #1A Shock: drop test in packaging per ISTA #1A
Enclosure (designed to meet)		IP54
Warranty		3 year meter replacement

Universal Power Adapter Operating Conditions	
Operating Ambient Temperature	0 to 50 °C
Operating Relative Humidity	0 to 90 %, non-condensing
Storage Temperature	-20 to +75 °C
Storage Relative Humidity	0 to 90 %, non-condensing
Pollution	Degree 2
Overvoltage	Category II

Individual parameter specifications are listed in the corresponding Orion VERSA STAR module reference guide.

NOTE: We reserve the right to make improvements. Specifications subject to change without notice.

The information will match the information recorded for that calibration.

Ordering Information

CML #	Description
VSTAR00	Orion VERSA STAR Benchtop Meter - Electrode arm with redesigned holder - Universal power adapter
VSTAR10	Orion VERSA STAR pH Benchtop Meter Set - Orion VERSA STAR meter with pH/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR12	Orion VERSA STAR pH Benchtop Meter Kit - Orion VERSA STAR meter with pH/temperature module - 8302BNUMD Orion ROSS Triode pH/ATC probe - 096019 Orion Star stirrer probe - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
VSTAR20	Orion VERSA STAR Conductivity Benchtop Meter Set - Orion VERSA STAR meter - Orion VERSA STAR conductivity/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR22	Orion VERSA STAR Conductivity Benchtop Meter Kit - Orion VERSA STAR meter - Orion VERSA STAR conductivity/temperature module - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 011007 conductivity standard, 1413 μ S, 5x60 mL - Electrode arm with redesigned holder - Universal power adapter
VSTAR30	Orion VERSA STAR RDO/Dissolved Oxygen Benchtop Meter Set - Orion VERSA STAR meter - Orion VERSA STAR dissolved oxygen/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR32	Orion VERSA STAR RDO/Dissolved Oxygen Benchtop Meter Kit - Orion VERSA STAR meter - Orion VERSA STAR dissolved oxygen/temperature module - 083005MD Orion polarographic DO probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - 970802 BOD funnel/stirrer - 080360 BOD adapter - Electrode arm with redesigned holder - Universal power adapter

CML #	Description
VSTAR40A	<p>Orion VERSA STAR pH/ISE Benchtop Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR40A2	<p>Orion VERSA STAR pH/ISE Benchtop Meter Kit</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - 8102BNUWP Orion ROSS Ultra pH electrode - 096019 Orion Star stirrer probe - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
VSTAR40B	<p>Orion VERSA STAR Benchtop Meter with Two pH/ISE Modules</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - Electrode arm with redesigned holder - Universal power adapter
VSTAR40B2	<p>Orion VERSA STAR Benchtop Meter with Two pH/ISE Modules Kit</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - 8102BNUWP Orion ROSS Ultra pH electrode - 096019 Orion Star stirrer probe - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Two electrode arms with redesigned holders - Universal power adapter
VSTAR50	<p>Orion VERSA STAR pH/Conductivity Benchtop Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature module - Orion VERSA STAR conductivity/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR52	<p>Orion VERSA STAR pH/Conductivity Benchtop Meter Kit</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter with pH/temperature module - Orion VERSA STAR conductivity/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 μS, 5x60 mL - Electrode arm with redesigned holder - Universal power adapter

CML #	Description
VSTAR80	<p>Orion VERSA STAR pH with LogR Benchtop Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature with LogR technology module - Electrode arm with redesigned holder - Universal power adapter
VSTAR82	<p>Orion VERSA STAR pH Benchtop Meter Kit</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature with LogR technology module - 8172BNX Orion ROSS Sure-Flow pH electrode - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 810007 ROSS fill solution, 5x60 mL - Electrode arm with redesigned holder - Universal power adapter
VSTAR90	<p>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Multiparameter Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR91	<p>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Multiparameter Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - Two 096019 Orion Star stirrer probes - Two electrode arms with redesigned holders - Universal power adapter

CML #	Description
VSTAR92	<p>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Multiparameter Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 083005MD Orion polarographic DO probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - 970802 BOD funnel/stirrer - 080360 BOD adapter - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 μS, 5x60 mL - Electrode arm with redesigned holder - Universal power adapter
VSTAR93	<p>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Ultimate Benchtop Multiparameter Meter Set</p> <ul style="list-style-type: none"> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 083005MD Orion polarographic DO probe - Two 096019 Orion Star stirrer probes - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - 970802 BOD funnel/stirrer - 080360 BOD adapter - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 μS, 5x60 mL - Two electrode arms with redesigned holders - Universal power adapter

Accessories	
CML #	Description
VSTAR-PH	Orion VERSA STAR pH/temperature module
VSTAR-ISE	Orion VERSA STAR pH/ISE/temperature module
VSTAR-CND	Orion VERSA STAR conductivity/temperature module
VSTAR-RD	Orion VERSA STAR RDO/DO/temperature module
VSTAR-LR	Orion VERSA STAR pH/temperature with LogR technology module
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
STARA-PWR	Replacement universal power adapter for Orion VERSA STAR meters
096019	Orion Star stirrer probe
8102BNUWP	Orion ROSS Ultra pH electrode, refillable, glass body
8172BNWP	Orion ROSS Sure-Flow pH electrode, glass body
8156BNUWP	Orion ROSS Ultra refillable pH electrode, epoxy body
8157BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, epoxy body
8302BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, glass body
8172BNX	Orion ROSS Sure-Flow pH electrode, glass body
8611BNWP	Orion ROSS sodium combination ISE
927007MD	Orion ATC probe, stainless steel body
927005MD	Orion ATC probe, epoxy body
013005MD	Orion DuraProbe conductivity cell, 4-cell, K=0.475
013016MD	Orion conductivity cell, flow through, K=0.1
083005MD	Orion dissolved oxygen probe, polarographic
086030MD	Orion auto-stir DO/BOD probe, polarographic
087010MD	Orion RDO optical DO probe, 3 m cable
810199	Orion ROSS all-in-one pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 4.01 buffer, 475 mL
011008	Orion conductivity standard, 100 μ S/cm, 5x60 mL bottles
011007	Orion conductivity standard, 1413 μ S/cm, 5x60 mL bottles
011006	Orion conductivity standard, 12.9 mS/cm, 5x60 mL bottles
1010001	Orion conductivity calibration resistor kit
9512HPBNWP	Orion high-performance ammonia ISE
9512BNWP	Orion standard ammonia ISE
951007	Ammonia standard, 1000 ppm, 475 mL
951210	Low-level ammonia ISA
951211	Ammonia ISA, 475 mL
951209	Fill solution for Orion high-performance ammonia ISE, 60 mL
951202	Fill solution for standard ammonia ISE, 60 mL
951213	Ammonia ISE storage solution
9609BNWP	Orion fluoride combination ISE
040906	Fluoride standard, 1 ppm with TISAB II, 475 mL
040907	Fluoride standard, 2 ppm with TISAB II, 475 mL
040908	Fluoride standard, 10 ppm with TISAB II, 475 mL
940909	TISAB II, 1 gallon
8611BNWP	Orion ROSS sodium combination ISE

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