



**Solartron
Metrology**

**Wigauge™
Multichannel WHT
User Manual**



AMETEK®
ULTRA PRECISION TECHNOLOGIES

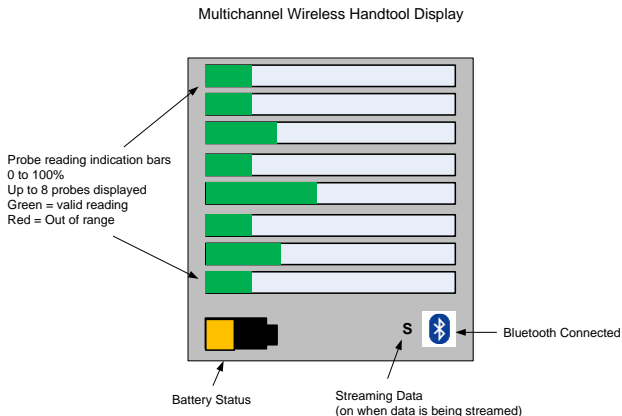
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1. Introduction & Safety Information

The Solartron Metrology Wireless Multichannel Handtool (WHT-M) is one of a series of Wireless Hand tools under the generic name Wigauge™, providing users with the means of hand gauging without the inconvenience of cables. The multichannel WHT is manufactured from hard plastic for robustness and is sealed to IP65 to withstand a machine shop environment.

The device also includes two push buttons, four LEDs, a buzzer and for some options a small LCD screen. The LCD screen makes the setting up of the probes in the handle easier, provides the operator with visual feedback of the probes position and simplifies diagnostics.



1.1. Introduction

- Read this instruction manual carefully and completely before using the WHT-M product.
- Always include this instruction manual when passing product onto a third party.
- Do not use an obvious defective product.
- Use only accessories as supplied by Solartron.
- Do not operate outside of the product specification (refer to product data sheet)

Intended Use

- Industrial use only for the measurement or positioning of parts and components.

Information such as data sheets and technical manuals for this product and the Digital Measurement System can be found on the Solartron web site.

www.solartronmetrology.com

1.2. Safety Information

Safety Information:

Equipment refers to all parts of the Wireless hand tool System (including but not limited to the hand tool itself, chargers and power supplies).

Terms in this Manual

WARNING statements identify conditions or practices that could result in personal injury or loss of life

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

Symbols in this manual



This symbol indicates where applicable cautionary or other information may be found

WARNINGS:

Do not operate any of this equipment in an explosive atmosphere.

Do not place, use or store the equipments where it can fall into or be exposed to liquids

This equipment is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the equipment by a person responsible for their safety.

Do not operate where aerosol spray products are being used or where oxygen is being administered

Do not operate if the equipment has been damaged

CAUTION:

Some charger configurations are operated via power packs that connect to the mains supply and suitable precautions must be taken. See separate section on chargers.

1.3. Manufacturer Declaration

WEEE Directive

Please dispose of this product correctly this will help to protect the environment in which we all live.

CE Conformity

- ROHS Directive (2011/65/EU)
- Safety (EN60950-1:2006) plus latest revisions
- EMC EN 61000-2 Emissions and EN 61000-3 Susceptibility

The CE Declaration of Conformity is available from Solartron Metrology if required.

Trademark and Copyrights

Wigauge™ is a registered trademark of Solartron Metrology Ltd.

Microsoft®, Windows® and the .NET Framework are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Bluetooth® is a registered trademark of Bluetooth SIG.

2. Wireless Handtool Implementation Options

The Wireless Handtool range of products have been designed to seamlessly integrate into an Orbit network or operate as stand-alone Bluetooth devices.

2.1. Orbit Solution

Solartron's WCM (Wireless Communications Module) is a device that enables the wireless handtool devices to be integrated into an Orbit network. The WCM removes the need to use Bluetooth libraries and PC Bluetooth interfaces leading to a robust and simple integration method. Multiple WCM modules can be put onto an Orbit Network and each module can communicate with 6 wireless handtool devices this overcomes the Windows/PC limitation of only having six devices connected. The Orbit Solution is detailed in the Orbit manuals that are included as part of the Orbit®3 Support Pack For Windows®

2.2. Standalone Solution

When used as stand-alone Bluetooth devices, their setup and reading of measurements is greatly simplified using Solartron's utilities and Solartron.NET library. These also help the user with integration into bespoke software packages

Note. Sections 3 to 6 of this document are only applicable to the Standalone Solution.

3. Set up and Installation

The WHT-M uses *Bluetooth*[®] technology to communicate with a *Bluetooth*[®] enabled device, including a PC running Windows 7 or later. The device must have a Bluetooth 2 'dongle' either built-in or installed via a USB port.

An initialization process is required to pair the WHT-M with the device. The Bluetooth[®] process should be plug and play.

The device should first be powered on by pressing either of the buttons on the device.

Your WHT-M should appear in the list of names as WHT-M_xxxxxxxx (the x's will be replaced by a string of characters to form a name similar to: WHT-M_130AJ11701

If it doesn't appear after a while, check the WHT is turned on then try again.

On most devices & operating systems, a pairing code is not required.

However if prompted for one, use the WHT-M pairing code: 61737

It will now show the final screen containing the list of *Bluetooth*[®] connections which can now be closed.

Do not leave the Bluetooth search running as the WHT-M streamed reading rate will be substantially reduced.

Your WHT-M Connection is now Set up!

3.1. Enhanced Security Function

- The latest Bluetooth protocol no longer supports legacy pairing and therefore we have now introduced our own security protocol at the application layer. This is achieved by allowing a device to be passcode enabled, requiring a set passcode to be sent once connected, that will prevent it from communicating until the sent passcode has been verified. This feature is disabled by default in the latest devices to ensure backwards compatibility with existing applications.
- Use the Configuration Manager to configure the passcode per device.
 - See the separate Configuration Manager manual for details.
- Once the passcode is activated, any user program must send the Passcode command to the tool as the first command after connection.
 - See the Software protocol manual for command details.
 - Our Configuration Utility program does this automatically.
- Note. If passcode is enabled and Streaming is set ON, streaming will not commence until the passcode has been sent.

4. Wireless support pack

The Wireless support Pack for Windows®, available for download from the Solartron website, contains the following WHT-M specific files:

- A Configuration Utility program which simplifies the configuration as well as retrieval of readings from the device.
 - The source code for this utility program is also provided.
- The Software protocol manual for those that wish to write their own programs to communicate with the WHT-M.
- The WHT-M Maintenance Tool, which reconfigures the system for replacement probes.
- The Configuration Manager application, which allows the WHT-M passcode to be activated.
- WHT Port Testing application & its C# source code are provided.
 - This demonstrates a reliable way of Bluetooth port opening and closing.

The Orbit®3 Support Pack also needs to be installed, which is also available for download from the Solartron website.

- This includes the WHT-M Maintenance manual, which describes:
 - How to carry out firmware upgrades using the Orbit3 Updater.
 - Reconfiguring the system for replacement probes, using the included Maintenance Tool.

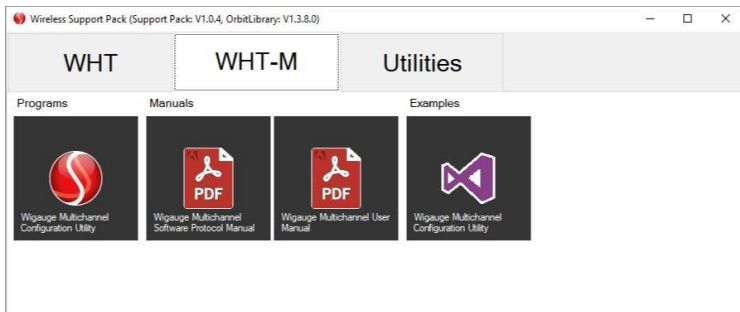
The support packs both require the Microsoft® .Net Framework 4.0 or newer to be installed on the PC.

When installed, the WHT-M files and the Configuration Manager are available via the Wireless Suite shortcut that is installed on the desktop as part of the Wireless support pack.

4.1. Wireless Suite Dashboard

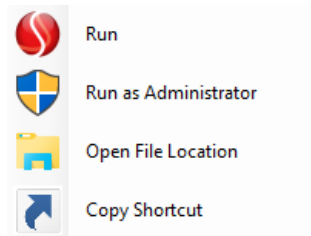
The dashboard provides easy access to all of the Wireless applications, manuals and example programs.

After installing the Wireless Support Pack for Windows®, a shortcut will appear on the Desktop and the 'Wireless Support Pack for Windows' will appear in the 'All apps' list:

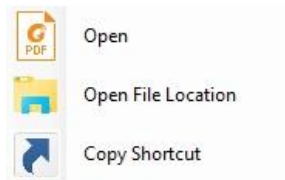


If you want to create a desktop shortcut to a particular application, right click the mouse and select 'copy Shortcut'.

For applications, the following will appear:



For manuals, the following will appear:



5. Wireless Multichannel Handtool Utility program

The Configuration Utility program is for Windows PCs running Windows 7 or newer.

It simplifies connecting to the device as well as providing simple windows controls for configuring all available settings.

It provides a section for displaying the data transmitted by the device and is also capable of logging the information to a file.

Each of the controls in the application will show 'tool-tips' if hovered over with the mouse, these tooltips provide information about the setting.

Note.

Before running the Multichannel Handtool utility, make sure that you have paired your Handtools and have them switched ON (Steady Blue light at the Gauge end of the Handtool).

The following diagram shows the application screen and basic areas of facilities provided.

Connecting & help

Device information

Configuration for: Bluetooth Power, Buzzer, Power

Button and LED configuration

Stream settings

Display settings

Streamed data viewer

Command history – i.e. the commands sent & received when settings changed

Battery status check

Logging to file settings

Stream information: speed/content

Click to show bar charts for streamed data

The screenshot shows the following interface elements:

- COM Port Selection:** COM139, Connect, Disconnect, About, Help for Users, Help for Programmers.
- Device Info:** Serial Number 128AK47701, Firmware Version V1.15, Channel specific information (Range / UOM etc) can be seen in the Streamed data below.
- Device Settings:** Bluetooth Class (Class1), Buzzer Configuration (TagTaken), Power Off Device (Auto Off Sec 300), Battery Status (Ok), Check Battery.
- Button and LED Settings:** Button Configuration (1: PowerOff, 2: Tag), LED Configuration (1: Streaming, 2: LowBatt, 3: Off).
- Stream Settings:** Enable Streaming (checked), Rate (100), Binary Mode, Binary Stream Length (64), Channel Enable (1-8 checked), Include Preamble, BattStatus, and Tag in Stream data (checked).
- Display Settings:** Orientation (AutoRotate), State (On), Mode (Charts), Channel (dropdown), Num DPs (4).
- Streaming data and logging:** Table with columns: ChannelID, ChannelNumber, Range, Reading, Status, TagNumber, UOM. Data rows for CHANNEL A through H.
- Command Messaging:** Log of commands and responses such as 'Rx: >>>StreamRate 100', 'Tx:SetStreamRate 100', etc.
- Log data to file:** Include Log timestamp, Lines logged (0), Display last Stream, Stream Rate (108), Average (59), Stream/Sec (11), Show Channel Charts.

The Handtool can also be controlled directly by a user application using a virtual Com port.

6. Communicating via a virtual Com port

For initial familiarisation, the Wireless Handtool utility program is recommended. However, once paired, the simplest independent method to communicate with the device is using an ASCII type serial port interface program, such as COMTestSerial (<http://www.microridge.com/comtestserial.htm>).

To determine which COM Port to use for communications, open the Windows Bluetooth Devices (usually by double clicking the Bluetooth icon in the system tray), select the relevant device, select 'properties', select the 'Hardware' tab and again click 'Properties' at the bottom. In the serial properties select the 'Port Settings' tab and click the 'Advanced' button. The bottom of the window provided shows the serial port 'COM' for the device.

Once connecting to the device, the device's default setting is to stream data at a rate of once every 100mS. This data will appear in the serial port application once connected. To switch off streaming simply type "StreamState Off" and hit the return key (see protocol document for more information).

The most useful command while using an ASCII interface like this is the help command, which provides information on all commands available. Simply type 'Help' or '?' followed by the return key to view this information.

7. Operating Modes

7.1. DATA TRANSMISSION

When configured to include Tag information and a button is configured to trigger a tag, the data is sent together with a tag number for the channels of data sent.

This tag number is a sequential number that cycles from 1 to 255, followed by 1 again (zero indicates not tagged data).

It is used to allow manually triggered readings to be identified among normal stream messages, or to trigger an immediate transmission when streaming disabled or configured for slow rates.

7.1.1. STREAMING

In this mode the WHT continually sends data to the controller.

The stream rate is fixed for the Orbit Solution, but can be adjusted on the Standalone Solution.

If a button is pressed in this mode the measurement being taken at the time the button is pressed is tagged.

This tagged data can be captured by the controller.

7.1.2. SINGLE SHOT

Tagged data is sent each time the button is pressed

Note the button must be set to the correct state to ensure tagged readings are sent, this is the normal or default mode, but it is possible to set the buttons to other modes – see section below on Button allocation

7.2. *BUTTON ALLOCATION*

Either button can be programmed to operate when pressed to perform the functions below.

- None : Not used – button ignored.
- Tag : Pressing the button causes current set of readings to be 'tagged' and transmitted.
- Power Off : Pressing the button for 2 seconds then releasing causes the device to power down.
 - If both buttons are set to 'Power Off', they will need to be pressed together to turn the tool off.

Note: Regardless of configuration, either button can be used to power on the device.

By default the buttons nearest the battery is configured with the Power Off setting and the front button is configured to Tag readings.

7.3. INDICATIONS

The WHT can provide both visual and audible indications to the operator. Some of these indications can be switched On or Off using the utility Software. The table below summarizes the indicators.

LED	Colour	Indication	Function
LED 1 (nearest battery)	Green	As configured	Off : LED will never illuminate Streaming : LED will blip each time a set of stream data is sent. Note: at fast streaming rates this can lead to a constantly illuminated LED while streaming. LowBatt : LED will flash when battery becomes close to exhausted Default = Streaming
LED 2	Red	As configured	As above Default = LowBatt
LED 3	Red	As configured	As above Default = Off

LED	Colour	Indication	Function
LED 4 (nearest tool head)	Blue	Power and Bluetooth Status	OFF – No Power ON – Power ON FLASHING, 2 times a second- Bluetooth Connection FLASHING, 4 times a second - Awaiting passcode (if activated)

7.5. Buzzer

- Off : Buzzer will never sound
- Tag : Buzzer will sound briefly when a set of readings are tagged and transmitted.

Note: Regardless of configuration, if the device is not currently connected (no means to transmit data) and a tag is requested (via button press), three beeps from the buzzer will be heard – this is to indicate the tagged data has not been transmitted.

7.6. Auto Off Configuration

The device can be configured to automatically switch off after a time period of no buttons being pressed and no commands received (it will Auto Power Off even if streaming is enabled as long as no button pressed and no command received).

This can be configured from 30-65535 seconds or zero, where zero disables the auto-off facility altogether.

The default is 300 seconds.

8. Battery Packs and Charging

The Multichannel Wireless Hand Tool is supplied with an inductively charged battery pack.

There are two types of battery pack as shown in the table below.

Battery Pack	Description	Pack Colour	Capacity
Inductive charged battery pack	Used with an inductive charger cradle (no connection point for conventional chargers is fitted)	Dark Grey/Black	5 hours continual running

Note: Battery packs are supplied fully charged.

8.1. Removal and Replacement of Battery Packs

Prior to removal ensure the tool and pack is clean to avoid contamination of internal connectors

To remove the battery pack for replacement unscrew the battery fixing screw (anticlockwise) and pull the battery pack from the WHT.

To replace the pack onto the WHT), replace the pack onto the tool and lock by turning the I screw clockwise until the pack is firmly secured.

8.2. Chargers



WARNING: Use of the wrong type of charger can cause damage to the equipment, ensure that the correct charging method is used for the application.

CAUTION: Do not charge in ambient temperatures of more than 30 degC. (86 degF.) as this may degrade battery life.

8.2.1. INDUCTIVE CHARGER/CRADLE

The inductive charger and cradle (used with the inductive battery pack only) charges the batteries when the tool is placed in the cradle. The inductive charger is powered from a 5Vdc power block. One power block can power up to 4 chargers.

There are two indication lights: green: power connected to cradle, blue: charging.

If the tool is not placed correctly into the cradle charging will not take place.

When using the inductive charger ensure the following:

- Only use the chargers for the purpose intended as described in this manual. Do not use with devices that are not approved by Solartron.
- Do not operate if the equipment has been damaged
- Do not use on heated surfaces or in ambient temperatures greater than 30 degC. (86 degF.)
- Do not insert metallic objects inside the cradle of the inductive charger unit.

There are two types of inductive charger for different mounting configurations Type A and Type B. Type A allows the tool to be mounted battery end down and provides some support for the tool. Type B is designed for the end user to incorporate into the hand tool cradle.

See product data sheet for charger cradle details.

9. Troubleshooting FAQ

This section contains Troubleshooting solutions in an FAQ format.

9.1. *I cannot get my COM port to work properly?*

If you have difficulty connecting the Bluetooth® WHT-M to your application software it may be because the default COM port is being held by Windows. In this case select, go to 'Device Manager' on the PC and investigate the problem.

10. Accessories

807501-SX	Programming Lead - WHT
805811-SX	Class 1 Bluetooth® USB Adapter
807013-SX	Inductive Battery Pack - WHT

11. Declaration of Conformance

11.1. Europe

Solartron Metrology Ltd declares that this product complies with the CE safety requirements and the electromagnetic compatibility requirements, in compliance with the following directives.

The devices have been designed, assembled and tested in compliance with the standards detailed below

Electrical Interference and Radiation	
Immunity	As per the D of C
Emissions	As per the D of C. Note. The WHT will radiate in the 2.4GHz band as this is the Bluetooth® transmission frequency
Bluetooth® Class 1	The WHT uses a pre qualified Bluetooth® module which is not modified in any way and therefore is Bluetooth® compliant.
Safety	As per the D of C. The WHT operates at voltages below 20V and therefore does not provide any electrical hazard to the user.

11.2. USA

This device complies with Part 15 of the FCC Rules. This device shall not cause harmful interference or be impacted by received emissions that may cause undesirable operation.


Caution: changes or modifications not approved by the party for compliance could void the user's authority to operate the equipment.

11.3. CANADA

This device shall not cause harmful interference or be impacted by received emissions that may cause undesirable operation.

Caution: changes or modifications not approved by the party for compliance could void the user's authority to operate the equipment.

Declaration of Conformity in accordance with the Directive 1999/5/EC (R&TTE Directive)

Manufacturer / Responsible Person	Solartron Metrology Ltd Steyning Way Bognor Regis West Sussex PO22 9ST United Kingdom
Declares that the product	WIRELESS MULTICHANNEL HAND TOOL
Description and Part Number(s)	WHT-M 977xxx-3
As a radio transmission module complies with the essential requirements of §3 of the EU directive 1999/5/EG (R&TTE) and the other relevant provisions.	
Harmonised standards	EN 301 489-17 V2.2.1 (2012-09) EN 300 328 V1.9.1
Electromagnetic compatibility	EN 61000-6-2 :2005 EN 61000-6-3:2007 EN 61000-6-3:2007/A1:2011 EN 61326-1:2013
Electrical Safety	EN 60950-1:2006 EN 60950-1:2006/A11:2009 EN 60950-1:2006/A1:2010 EN 60950-1:2006/A12:2011
This device is usable for the following	Industrial use only for the Dimensional Measurement of Parts
Operating Purpose	Dimensional Measurement of parts
Description of electronic interface	Class 1 Bluetooth
Bognor Regis: 13th March 2016 (Place, Date placing into market)	 Nick Deadman, Technical Director

12. Return of Goods

Devices returned for service/repair/recalibration should be shipped prepaid by your distributor or, if purchased direct from Solartron Metrology, to the relevant Sales Office.

The shipping container should be marked:

'For the Attention of the Customer Service Department'.

The following should accompany the device(s):

1. Contact details of company/person returning device including shipping instructions.
2. A statement of service required.
3. Description of the device fault and the circumstances of the failure, including application, environment and length of time in service.

Alternatively there is a returns form available on our web site, follow link to:

<https://www.solartronmetrology.com/service-and-support/ukservicecenter>

Please note:

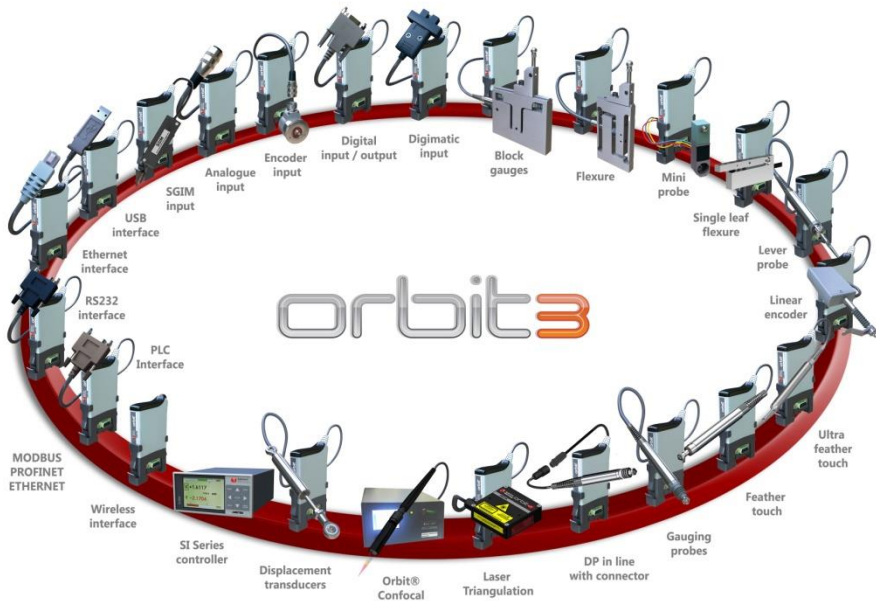
A standard assessment charge is applicable on all non-warranty devices returned for repair. Customer damage and any device found, upon inspection, to have no fault will be considered non-warranty.

Please contact the Sales Office or Distributor for warranty terms, service options and standard charges.

Adherence to these procedures will expedite handling of the returned device and will prevent unnecessary additional charges for inspection and testing to determine the condition.

Solartron Metrology reserves the right to repair or replace goods returned under warranty. All repairs are guaranteed for 3 months (unless otherwise stated).

Solartron Metrology reserves the right to make changes without further notice to any products herein to improve reliability, function or design. Solartron Metrology does not assume any liability arising out of the application or use of any product or circuit described herein, neither does it convey any licence under patent rights nor the rights of others.



13. Solartron Metrology Offices

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Solartron pursues a policy of continuous development, Specification in this document may therefore be changed without notice