User Manual

INTELLIPROBE 360™ WIRELESS

API Automated Precision Inc.
www.apisensor.com

IntelliProbe 360™ ₍User₎ Manual Version 1.3
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WARNING:

Some models of the equipment described in this manual use a laser.
The laser is a Class II, Helium Neon, with a 1 milliwatt max/cw output.
DO NOT STARE INTO THE BEAM.
Failure to comply with this Warning may result in
permanent eye damage.

<u>Proprietary Data</u>

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AUTOMATED PRECISION, INC. products are warranted against defects in material and workmanship for a period of two years from date of purchase. During this warranty period, AUTOMATED PRECISION, INC. will, at its option, either repair or replace products which prove to be defective.

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1 Introduction

This user manual contains general and detailed information on the installation, operation, and maintenance for the IntelliProbe 360™ Wireless and IntelliProbe 360™ (Wired) products in the Automated Precision Inc. (API) I-360™ family of products.

The I-360™ family of products includes the I-360™, the IntelliProbe 360™, the IntelliProbe 360™ Wireless, and the IntelliScan 360™.

I-360™	is an API laser tracker accessory designed to provide both hand-held probing and hand-held laser scanning (contact and non-contact measurement) in the same instrument.
IntelliProbe 360™ (Wired)	is an API laser tracker accessory designed as a hand-held probing-only instrument (contact measurement).
IntelliProbe 360™ Wireless	is an API laser tracker accessory designed as a wireless hand-held probing-only instrument (contact measurement).
IntelliScan 360™	is an API laser tracker accessory designed as a hand-held laser scanning-only instrument (non-contact measurement).

In this manual the IntelliProbe 360™ refers to both the Wired and Wireless version of the hand-held probing solution.

2 SYSTEM SETUP

What's in the Box:

Open the IntelliProbe 360™ case and you will find the following:

1. IntelliProbe 360™ instrument
2. Wired communications cable
3. Two antennae (one long, one short) *Wireless unit only*
4. Two Lithium batteries with battery charger *Wireless unit only*
5. Wired probe power supply
6. Software CD with parameter files and Tracker3™ firmware update
7. Two probe styli
8. 1.5 inch semisphere adapter.

Figure 1: IntelliProbe 360™ Case

API Tracker3™ Setup:

Refer to the back of the API Tracker3™ controller in Figure 2. For wireless communication, ensure the supplied long antenna is tightly screwed into the "Antenna" connector and the RF receiver on the Tracker3™ controller is switched to the "ON" position (if using IntelliProbe 360™ Wireless). If utilizing a wired connection, plug the supplied communication cable (Figure 3) into the accessory outlet on the API Tracker3™ controller.

Figure 2: API Tracker3™ wireless configuration

Figure 3: Wired communication cable

API IntelliProbe 360™ Wireless Setup:

Remove the IntelliProbe 360™ Wireless instrument from the case. First locate the Lithium battery from the case (ensure the battery is charged), and plug the battery into the lower end of the probe, as shown in Figure 4. If the battery is not charged, use the supplied battery charger to charge the battery before using the system.

Note: The IntelliProbe 360™ Wireless is offered with three battery options:
1. 1400 mAh – rated for 2.5 hours of continuous use
2. 2760 mAh – rated for 6 hours of continuous use
3. 4140 mAh – rated for 9 hours of continuous use

For reference, the battery shown in Figure 4 is the large-capacity 4140 mAh battery. The standard IntelliProbe 360™ Wireless package is shipped with two (2) 2760 mAh Lithium batteries.

Figure 4: Inserting the Battery

Refer to the IntelliProbe 360™ Wireless instrument. Mounted on the rear of the handle (Figure 5), a power switch is used to power on the instrument. Be sure to configure the probe according to one of the operational modes discussed below.

Head LEDs
Head LEDs

Retroreflector (hidden)
Retroreflector (hidden)

Wireless Transmitter/Receiver

Wired Power and
Communication Outlet

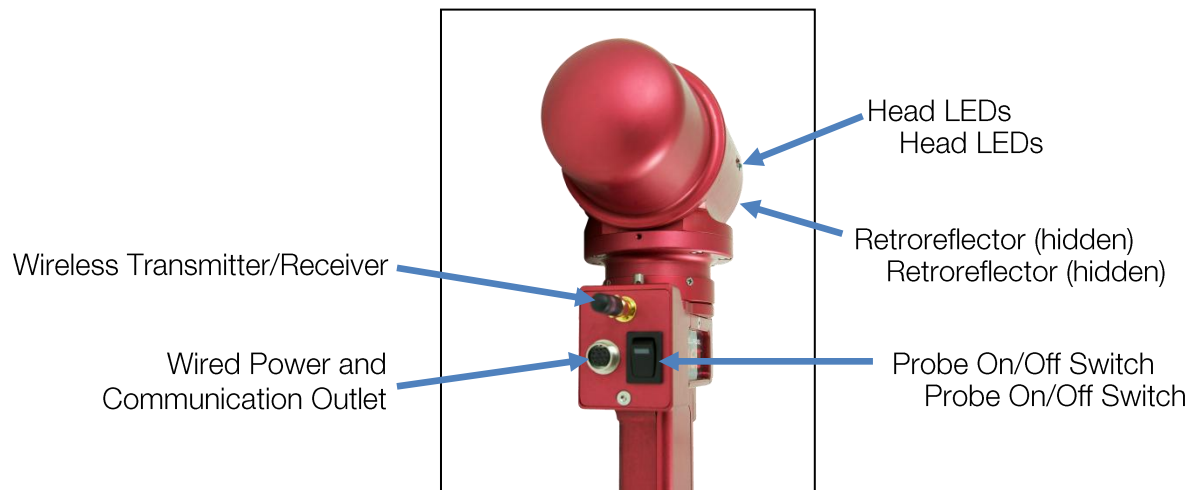Probe On/Off Switch
Probe On/Off Switch

Figure 5: IntelliProbe 360™ Wireless diagram

The IntelliProbe 360™ Wireless instrument has two operational modes: (1) Wireless communication utilizing RF frequency communication between the IntelliProbe 360™ Wireless and the Tracker3™ and (2) Wired communication utilizing the supplied cable to communicate between the IntelliProbe 360™ Wireless and the Tracker3™. You must use the proper hardware configuration shown below for operation in these modes.

Example of Wireless Communication

Example of Wired Communication

API IntelliProbe 360™ Setup: (Wired)

If the IntelliProbe 360™ unit is not wireless-capable, use the following steps to setup the unit.

Remove the following cable accessories from the case as shown in Figure 6:

Figure 6: DC 12 Volt Power supply   **IntelliProbe 360™ Wired Communication cable**

To supply power to the hand-held probing unit, plug the DC 12 Volt power supply into the receptor on the IntelliProbe 360™ Wired Communication cable as shown in Figure 7:

Figure 7

Refer to the back of the Tracker Controller: Plug in the Wired Communication cable into the "Accessory Port" as illustrated in Figure 8:

Figure 8

Remove the IntelliProbe 360™ unit from the case and refer to the features of the hand-held unit in Figure 9. To utilize this unit, the user must plug the free end of the Wired Communication cable into the rear of the IntelliProbe 360™ hand-held unit and enable the Probe On/Off switch.
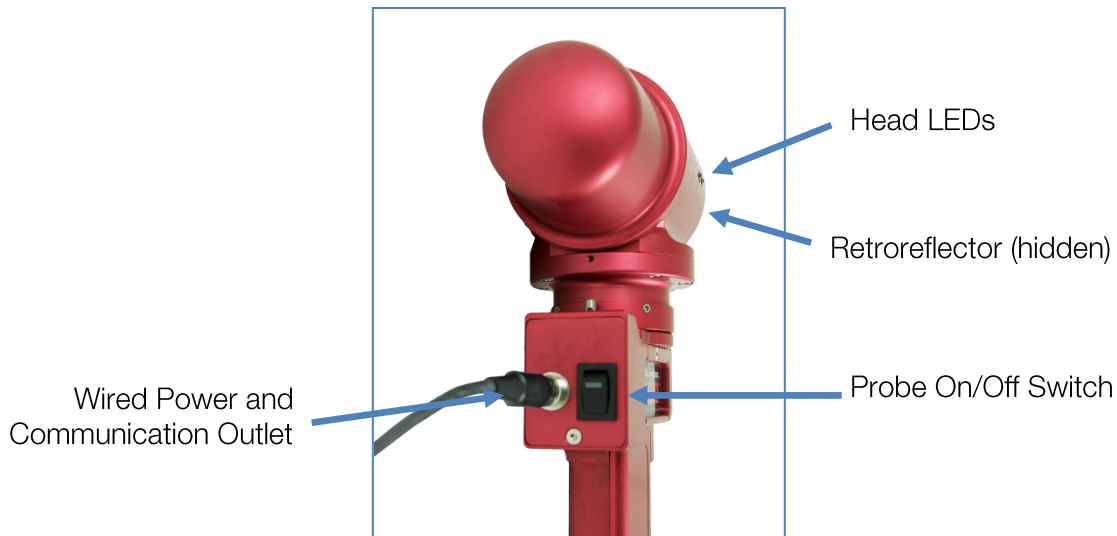

Head LEDs

Retroreflector (hidden)

Probe On/Off Switch

Wired Power and
Communication Outlet

Figure 9: IntelliProbe 360™ (Wired) diagram

3 SYSTEM OPERATION

Before operation, you need to determine if your Tracker3™ firmware is compatible with the IntelliProbe 360™ Wireless system. To do this, start the TrackerCal™ software (included with Tracker3™ system) and navigate to 'Help -> About Tracker'. The firmware version reported should be no less than v. 5.167. If the firmware version is earlier than 5.167, you will need to follow the detailed steps below for uploading the new firmware.

Applying the PRM File:

When the correct firmware version has been confirmed, copy the PRM file from the software CD to "C:\Program Files\Automated Precision, Inc\PRM Files" (create this folder if it does not exist).

About the PRM File:

The PRM file contains all of the factory settings for your IntelliProbe 360™ system. This file is different from the Tracker3™ PRM file stored on the Tracker3™ controller and downloaded to the computer each time you start the software. The IntelliProbe 360™ PRM file will not be stored or automatically downloaded on Tracker3™ controller. Please note that the instrument can only be operated successfully using a computer that contains the IntelliProbe 360™ PRM file (or a copy thereof) in the directory "C:\Program Files\Automated Precision, Inc\PRM Files". Each PRM file has a name corresponding to the instrument's serial number (usually in the form "xxxx.PRM").

IntelliProbe 360™ Index Search:

If the red and green LEDs on the head of the IntelliProbe 360™ are rapidly flashing, this indicates the index searches for the yaw encoder and the roll encoder have not been completed. To perform the proper index searches, hand hold the IntelliProbe 360™ upright, then perform the following steps:

1. Rotate the head about the yaw axis back and forth until the green LED stops flashing. This indicates that the yaw encoder index search has finished successfully.

2. Rotate the instrument about roll axis until the red LED stops flashing. This indicates that the roll encoder index search has finished successfully.

Step 1: yaw encoder index search   Step 2: roll encoder index search

Software Operation:

Please refer to the separate software manual for initialization and operation of IntelliProbe 360™ in specific software packages.

General Operation:

When the Tracker3™ initializes, the system should perform an accessory search, locating and recognizing the IntelliProbe 360™ system. If the IntelliProbe 360™ is not recognized, or fails to show up in the software package, check that the tracker firmware is 5.167 or later; that all connections are secure between the IntelliProbe 360™ controller and the Tracker3™ controller; and that the IntelliProbe 360™ controller is powered on. Once the software has initialized and the accessory search has been completed successfully, you must perform a *Virtual Level* routine.

☛IMPORTANT NOTE: *You **MUST** perform the Virtual Level routine before taking any data with the IntelliProbe 360™ system.*

For information on how to perform the Virtual Level routine, refer to the relevant IntelliProbe 360™ software user manual. The Virtual Level routine will take gravity-frame measurements in all four quadrants of the Tracker3™ azimuth, so first ensure the "Servo" switch on Tracker Controller is powered on. When you wish to take measurements with the IntelliProbe 360™ instrument, you must steer the Tracker3™ beam close to the retroreflector on the IntelliProbe 360™ instrument, making sure that the lens cap on the retroreflector has been removed. After moving the IntelliProbe 360™ retroreflector to acquire the Tracker3™ laser beam, you must hold the IntelliProbe 360™ instrument stable and allow the red LED on the head of the IntelliProbe 360™ to dim.

IntelliProbe 360™ Measurement:

Select a stylus and thread it securely into the IntelliProbe 360™ instrument. You will need to select the stylus length, tip offset, and orientation in the application software.

☛IMPORTANT NOTE: *The user must be attentive to select the correct stylus orientation and length in the application software before measurement. For more information about how to utilize these software features, refer to the relevant application software manual.*

Orient the IntelliProbe 360™ instrument to the point that you wish to acquire, rotating the yaw joint to keep the beam centered in the IntelliProbe 360™ retroreflector. Touch the probe tip to the point you wish to measure, and gently (but firmly) pull and release the trigger on the IntelliProbe 360™ unit. The green LED will momentarily illuminate to indicate that the unit is taking data. When the green LED dims, the measurement is complete and the data has been sent to the software. To acquire data in probe scan mode, select said mode in the software and **press and hold** the trigger on the IntelliProbe 360™. When the green LED illuminates, data acquisition has begun. Release the trigger to end the data acquisition routine.

IntelliProbe 360™ Best Practices:

To achieve optimal accuracies, it is important you attempt to follow this guide. All practices outlined in this guide are designed to allow the IntelliProbe 360™ to realize the highest accuracies and most repeatable measurements the system can produce.

User Best Practices for Operating the IntelliProbe 360™:

1. **Avoid stressing the stylus while measuring with the IntelliProbe 360™.** Load on the probe tip may be reduced by using two hands during measurements and lightly touching the stylus to the surface being measured. Avoid resting the entire weight of the IntelliProbe 360™ instrument on the stylus.

2. **Avoid unnecessarily exercising the IntelliProbe 360™ system over large angles during measurement.** If possible, attempt to use the IntelliProbe 360™ in the same orientation throughout multiple measurements. The IntelliProbe360™ is fully capable of measurement at any angle, however, you will achieve higher accuracies and repeatability by keeping the IntelliProbe 360™ geometry constrained.

3. **Hand-tight is the rule for attaching your stylus.** Do not attempt to use tools or leverage to thread the stylus into the IntelliProbe 360™. By hand, thread the stylus into the IntelliProbe 360™. Firmly tighten the probe.

GETTING HELP WITH API PRODUCTS:

API Publications:

The setup and use of the IntelliProbe 360™ is included in this manual. Below is a list of other helpful manuals available from API:

Tracker3™ User manual: Discusses the setup and use of the Tracker3™ laser tracker

TrackerCal™ User Manual: Discusses how to perform diagnostic checks and complete calibration routines for the API Tracker3™

SpatialAnalyzer™ User's Guide: Details the use of SpatialAnalyzer™ with the Tracker3™

API Customer Support:

API is committed to providing superior support to customers. To assist you with technical and application questions API asks that customers use a following method to contact our help desk:

Mailing address
API Worldwide Headquarters
15000 Johns Hopkins Drive
Rockville, Maryland 20850

Telephone
Contact the help desk at 800-537-2720
between the hours of 8:30AM and 6:00PM EST.

Fax
Forward your questions with a detailed description to 301-990-8648.
Please include a return telephone number that can be used to contact sender.

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Automated Precision Inc.
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About API

Automated Precision Inc. (API) is a world leader in advanced measurement solutions. Founded by Dr. Kam Lau in 1987, API leads the metrology industry through innovation and higher standards of accuracy. API products are used by the world's leading automotive, aerospace, machine tool, and CMM manufacturers. The experienced engineering team at API is unmatched in its ability to create advanced, innovative products, which meet the needs of rapidly evolving industries.