Workhorse II FAQ

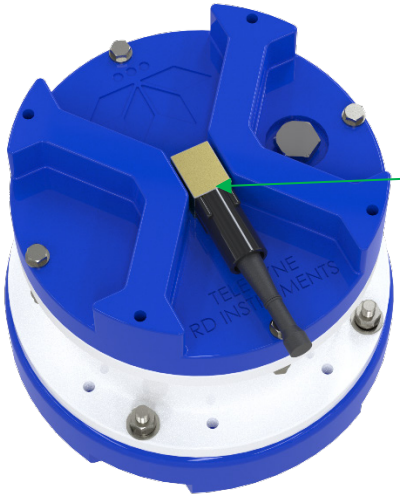
Date: April 2023

GENERAL AND TECHNICAL QUESTIONS

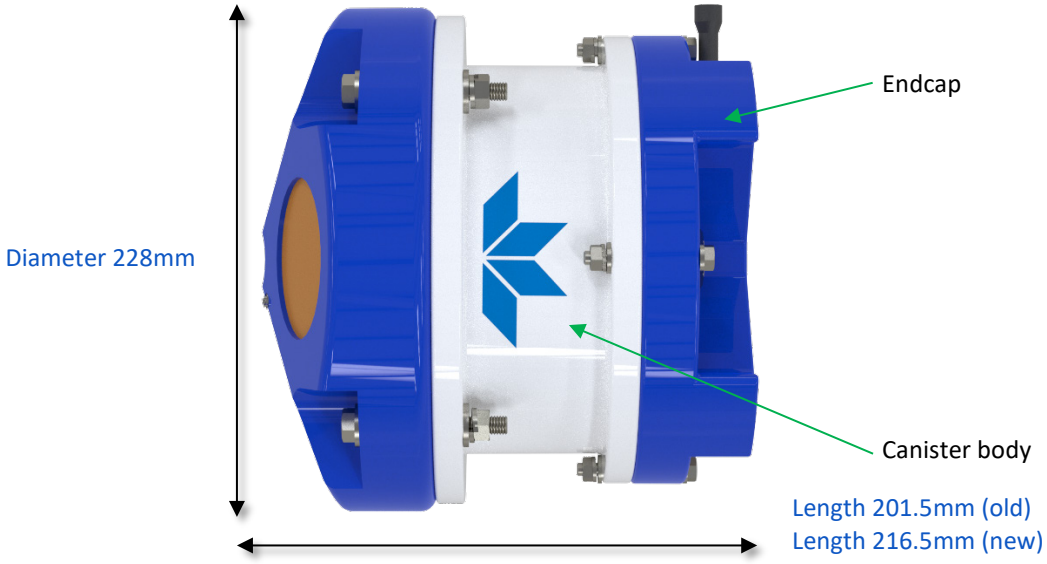
1. **What is Workhorse II?**
    a. Workhorse II (WHII) is a design refresh of TRDI's popular ADCP known as the Workhorse. The look and feel of the WHII is similar to the original Workhorse product, with several improvements.
    b. The WHII design applies to the Workhorse Monitor, Sentinel and Mariner products which operate at acoustic frequencies of 300 kHz, 600 kHz, and 1200 kHz.
    c. The WHII design does not apply to the lower frequency products which use 150 kHz and 75 kHz.
    d. The WHII *electronics* design applies to 6000 meter-rated products. However, the WHII *mechanical* design does not apply. 6000 meter-rated products will retain the original Workhorse 6000 meter-rated mechanical design.

2. **Why did TRDI refresh the Workhorse?**
    a. The original Workhorse remains in high demand while sourcing the electronic components has become more difficult due to the age of the design. The difficulty was intensified by the COVID-19 pandemic and subsequent global supply chain issues.
    b. A secondary reason was an opportunity to incorporate feedback from the field to make improvements while retaining the core features of the original Workhorse. For example, the underwater connector was made more robust and the memory size was significantly increased, but the dimensions of the product remain unchanged.

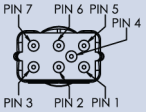
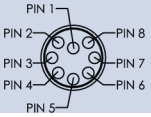
3. **What is new in the WHII compared to the original Workhorse?**
    a. **Electronics** refreshed with newer components that will extend the life of the product line and our ability to support repairs and spare parts.
    b. **Memory:** 4 GB Compact Flash replaces 4 GB PMCIA
    c. **Compass:** New TRDI compass (also called the "ISM" Integrated Sensor Module) with improved performance at higher latitudes
    d. **Compass calibration:** procedure and software improved for easier use and better results
    e. **Raw magnetometer data:** logged during the measurement, plus TRDI software to "post-correct" ADCP data after a deployment to account for magnetic field changes. This assumes that the ADCP rotates during the deployment.
    f. **Underwater connector**: Round, metal shell, MCBH with threaded locking sleeve replaces the rectangular, low-profile LPMBH for improved protection from damage and wear-and-tear that can compromise watertight integrity.



g. **Housing length:** Depending on the age of the old WH being compared, about 15 mm of length has been added to the WHII endcap to accommodate the MCBH connector. The diameter of the canister body remains unchanged. TRDI has no plans to make further changes to the WHII housing dimensions.



h. **New software tools: added** user friendly graphics to aid in fast and foolproof setup for deployment. The main differences are further summarized in the table below:

	WorkHorse	WorkHorse II	Advantage
Connector Type **Standard cable PN**	LPMBH 7 pin 737-3009-XXX 	MCBH 8 pin 737-3172-XXX 	Watertight integrity. Improved strain relief and protection of connector and cable over years of deployments.

	WorkHorse	WorkHorse II	Advantage
Memory	PCMCIA, 4 GB max	Compact Flash, 4GB	Increased data capacity; standard hardware
• **LADCP WM15** • **Surface Tracking WM15** • **High-res WM11** • **High-speed sampling WM12**	Purchased options	Standard	More features available on standard product at no additional cost.
Compass Accuracy / Resolution / Max Tilt	±2° @ 60° magnetic dip angle, 0.01°, ±15°	1°RMS, 0.1°, ±70°	Higher accuracy heading corrections over a wider tilt range allows higher accuracy velocity data under more conditions.
Pressure Sensor / Short-term uncertainty Max. drift	Optional ±0.1% ±0.25%	Standard ±0.1% ±0.25%	Standard 20 Bar pressure sensor included, or 600 BAR (optional).
Raw Field Strength Recorded	NA	Firmware enabled	Fix otherwise unusable data or improve accuracy of data set where magnetic field is suspected to have changed during deployment.
Tilt Range / Accuracy / Resolution	±15° ±0.5° (up to 15°) 0.01°	±90° ±0.3° at ±70° Total tilt 0.06°	Higher accuracy pitch and roll corrections over a wider range allows higher accuracy velocity data under more conditions.
Software	WinSC, WinADCP	Workhorse II Plan, WinADCP, ISM Compass Calibration, Compass Post Calibration	Easier-to-use graphical display of setup and calibration along with more visual prompts ensures accurate yet efficient setup and processing.

4. **Is WHII interchangeable with my original Workhorse's mooring hardware? Is it interchangeable from a data perspective? Is WHII a drop-in replacement for the original WorkHorse?**
    a. Yes, as long as you note:
        i. There is a small ~15 mm increase in the endcap length. The diameter remains unchanged.
        ii. The new 8-pin MCBH connector means you will need to use the new cable that comes standard with a WHII (if you use a nonstandard length, purchase a new cable). You can also purchase an adapter which allows the 8-pin MCIL to mate with the old style 7-pin LPMBH.
        iii. Water Modes 5 and 8 are not available with the WHII. These pulse-to-pulse coherent modes should no longer be in use; they were superseded by Mode 11.

iv. WHII operates using same data formats and delivers data in the same, reliable manner, with the same (or improved) specifications as the original Workhorse.

b. While we encourage everyone to take advantage of the improved cable and bulkhead connector, if your integration necessitates use of the WHII with an original WH cable, we offer an adapter cable: 737-3171-00 Cable, MCIL-8-FS to TRDI-7-MP, Conversion, WHII Endcap, 0.5m. This allows use of new WHII ADCP with original 7-pin WH cable.

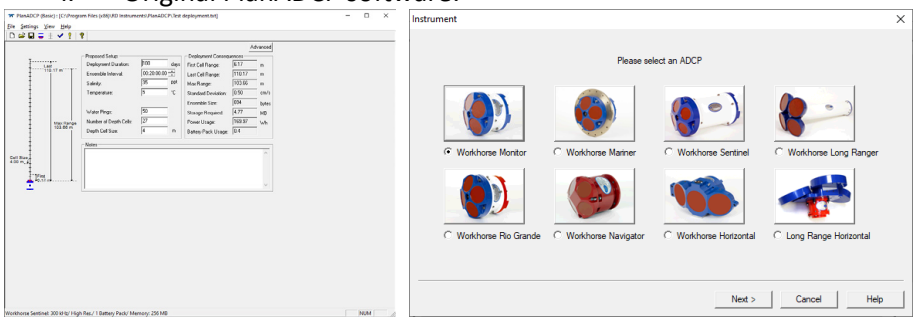
5. Does WHII use the same battery as original Workhorse? What about power consumption?

a. Yes, the same size and capacity battery packs are used. Power consumption is also roughly equivalent.

6. What are the differences between PlanADCP software and WorkHorse II Plan software?

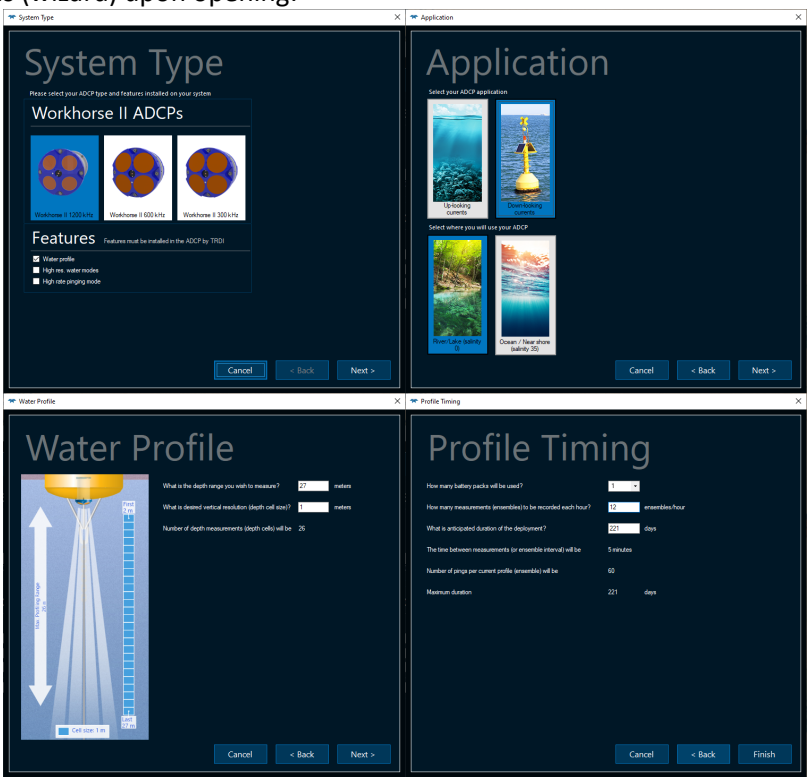
a. The new software (WorkHorse II Plan) has a more modern look and feel, with additional graphics that help guide you during the process of setting up the ADCP. For example:

i. Original PlanADCP software:

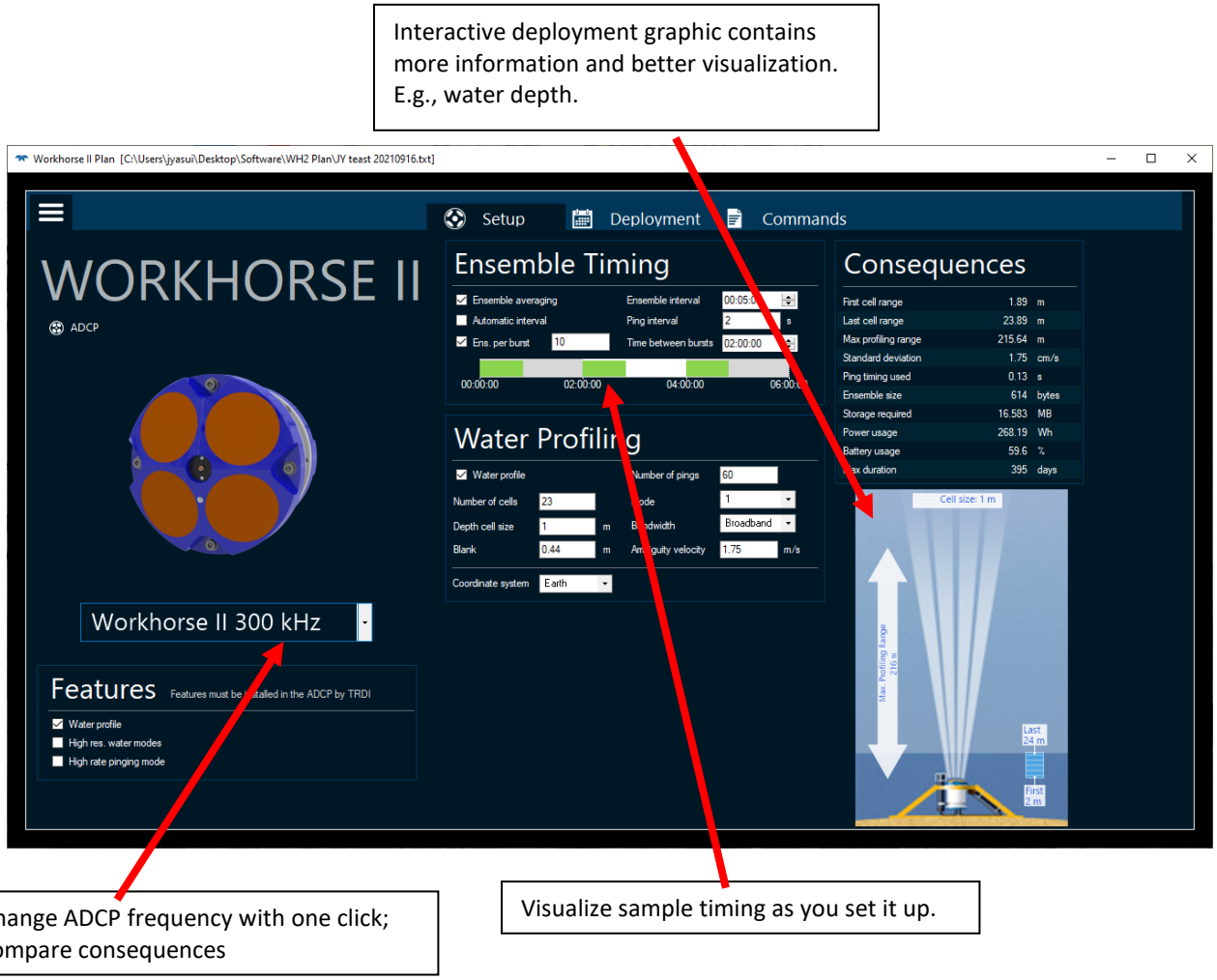


ii. New WorkHorse II Plan software:

Guidance screens (wizard) upon opening:



New main window:



SALES QUESTIONS

1. **When will TRDI start to ship WHII? When will the original Workhorse design be phased out?**
    a. We expect an overlap of shipping both original Workhorses and WHII, from about November 2022 to March 2023, though this is subject to change. Depending on part availability during this transition period, orders for original Workhorses may be fulfilled with either original Workhorse or WHII parts. We anticipate the transition period to end around March 2023, when our factory inventory will be fully transitioned to the WHII design only, though this is subject to change.

2. **What is the WHII price compared to original Workhorse?**
    a. The price of the WHII in 2023, and whether it differs from the original Workhorse, will depend on the frequency. Compared with June 2022 prices, 300 kHz models will see little to no increase. 600 and 1200 kHz models will see larger price increases. Any increases in price are not related to the Workhorse product line per se, but to supply chain and inflationary pressures that have been affecting most of our products and affecting most electronics manufacturers worldwide in the wake of the COVID-19 pandemic.

3. **How long will you continue to service the original Workhorse after its phase-out?**
    a. A main reason for the refresh of the Workhorse was to enable it to be easily serviced and supported for many years to come. Going forward the WHII electronics will be used to repair original Workhorses. Because of the WHII project, it can be generally advised that the most popular models and frequencies of Workhorse (300/600/1200 kHz, Monitor/Sentinel) remain fully supported.
    b. The H-ADCP and Quartermaster models of the Workhorse were discontinued in March of 2022. These will continue to be serviced pending part availability, noting that time and expense of repairs may be impacted in the years following discontinuation. H-ADCP, Quartermaster, and Long Ranger models cannot be repaired or upgraded with WHII parts.

4. **Can I still purchase board replacement kits?**
    a. We encourage you to work with our field service team and repair department before deciding replacement boards are the right option. If they are, then yes, we offer kits to upgrade original WH electronics to the WHII electronics. Except for the receiver board, the whole board stack must be replaced. Individual boards within the stack cannot be mixed using both WH and WHII parts. As an aftermarket part, we offer the kits only, not individual WHII boards.

Part Number	Description
Workhorse to Workhorse II Upgrade Kits	
707-2038-12	KIT, UPGRADE, ISM, MAIN ELEC, ASSY, 1200KHZ, WHII
707-2038-13	KIT, UPGRADE, ISM, MAIN ELEC, ASSY, 600KHZ, WHII
707-2038-14	KIT, UPGRADE, ISM, MAIN ELEC, ASSY, 300KHZ, WHII

5. **Are there any changes to how I order the WHII?**
    a. Yes, there are new part numbers for the ADCP. Additionally, if you receive a quote from a TRDI sales manager, you will see some parts itemized in greater detail than in the past. For example, the cable and accessories kit will be shown as separate lines.
    b. The standard cable that comes with the WHII Monitor is a 5m pigtail. The standard cable that comes with the WHII Sentinel is a 5m power/comms cable with ends that are terminated with power and DB9 serial connectors. If you need to replace the standard cable with a different cable, please let the TRDI sales manager know.
    c. The 48V AC power supply is no longer automatically included with the accessories kit. If the power supply is desired, please add it as an additional item: 717-3014-00, Power Adapter, AC to 48 VDC with cable plug.