UPLC-II RELEASE ANNOUNCEMENT

DATE: May 5, 2014

The UPLC-II is the next generation of the Universal Power Line Carrier and is fully compatible with AMETEK's older UPLC and TC-10B/TCF-10B products including checkback and Trip testing features. It is form, fit, and functionally the same as the UPLC, except for the addition of 4 significant new features. It is the same physical size with the same input/output connections as the UPLC, although it has a standard new front Ethernet port and front RS232 port for PC interface on all units. The UPLC-II does not have a front USB port option because the new high speed Ethernet port replaces it. It requires no changes to any system wiring when replacing a UPLC. Software operation of the UPLC-II remains almost identical to the UPLC with the exception of some new items on the admin web page for new features.

In approximately 6 months time the UPLC-II will be replacing the UPLC, but Ametek will continue to support UPLC repairs/service for the same length of time as we support UPLC-II. The plug in modules/boards in a UPLC-II are backwards compatible with a UPLC in that they can be used in a UPLC without an issue, although some board changes require a software key to change the catalog number of the UPLC before using and may require a firmware upgrade also. There is no need to carry separate spare boards for each product.

There is a simple firmware upgrade for the UPLC to make it have some of the new features of a UPLC-II. However, two of the UPLC-II new features will be only available by sending into the factory for a hardware upgrade with cost involved to upgrade. These include enabling a front Ethernet port for PC interface and adding frequency selectivity to our built-in TX reflected power meter so that it will measure accurately all the time even without having to turn off other interfering transmitters. Listed below are the details of all these new features.

STANDARD UPLC-II NEW FEATURES DETAILS:

1. **Protective Relaying Security/Dependability Improvements** - Several months of engineering effort were put into redesigning noise detection, optimizing filters, removing unnecessary delays in our DSP (digital signal processing) firmware to give maximum security and dependability. Then thorough testing was done to compare the following three products against each other using the same test set up.

   - TCF-10B

   - UPLC with V3.07 and lower firmware

   - UPLC-II with V3.08 – V4.01 firmware

   For **protective relaying security**, there was a significant **increase of 5X to 100X better** security with the UPLC-II versus the prior industry state of the art performance of the UPLC or TCF-10B. When comparing any power line carrier equipment protective relaying security it is important to note the settings of two parameters, added pre-trip time delay and receiver filter bandwidth, or else the data is meaningless. Some suppliers do not adequately specify this making comparison of specifications impossible without actually testing.

   For **protective relaying dependability** the significant improvement came as a result of getting a TRIP through the channel faster under high noise conditions. This means the TRIP is there when it

is supposed to be and does not miss it's time window to be considered a valid trip. We did this by eliminating the noise clamp that blocks Trip and Guard outputs during a high noise event. With earlier UPLC V3.07 and lower firmware, when the UPLC was used for DTT applications this noise clamp block lasted 50 msec and for UB/POTT applications it lasted 10 msec. There also could be multiple cascading noise clamp blocks that occurred when there were several closely spaced noise bursts extending the block of the Trip and Guard outputs for much longer than these times. So with the new firmware the **Trip time is greatly sped up during high noise,** which effectively improves dependability.

2. **Management User Interface** – Allows an IT manager to write a routine to automate changing/authenticating passwords and checking firmware/hardware versions via Ethernet. This interface requires adding a new user to the log in web page called ''Management User'' which can log into the unit while another user is simultaneously accessing the unit if desired. As a ''Management User'' you must use certain web browser address line commands to interact with the UPLC-II.

3. **Front Ethernet Port for PC Interface** – In addition to allowing 100X faster connection speed compared to the RS232/USB ports, this provides for an easier PC set up. Also it gives the option to make the 2 rear Ethernet ports operate in the redundant mode, as previously, or in a new daisy chain mode where other UPLCs or any Ethernet connected device can be daisy chained to the UPLC-II with the UPLC-II acting like a switch. This is a new software setting now on the admin web page. (Note**:** The front Ethernet port is completely isolated and is intended solely for PC interface. The rear Ethernet ports can be used for PC interface or other features such as DNP3 or IEC61850 communication.) There is an upgrade available for adding this feature that requires sending the unit back to the factory and changing the Ethernet daughter board (mounted on the Transceiver board), changing the front door, changing the display board if less than rev 9, and adding a ribbon cable. Consult sales for pricing.

4. **Frequency Selectivity for the TX Reflected Power Meter** – Allows continuous and highly accurate monitoring/alarming for high reflected power even though other interfering transmitters are transmitting on the same power line. This is similar to the more modern reflected power meters with built-in frequency selectivity made by test equipment companies. The customer can now use the UPLC-II reflected power meter along with its associated settable high reflected power alarm to indicate that something (such as a bad coax, bad line tuner, bad coupling cap, or bad line trap) has caused an impedance mismatch at that end of the power line. Because the meter is built-in and always monitoring the line it is very helpful in catching problems before they disable the PLC system, as well as giving direction to which end of the line has a problem. There is an upgrade available for adding this feature that requires sending the unit back to the factory and changing the Power Amp board and the Transceiver board, and adding 2 wires to the backplane. Consult sales for pricing.

"The release of the UPLC-II represents a giant leap forward in microprocessor-based Power Line Carrier products available on the market today" says Brian Hoffmann, Division VP and Business Unit Manager at AMETEK Power Instruments. "We have put a considerable amount of engineering and application test time into this product and feel confident that it represents the highest quality and most feature rich PLC product available today." The UPLC-II is the latest addition to the AMETEK Power Instruments portfolio of high performance power monitoring and communication products designed for the utility industry. See www.ametekpower.com for more information.