

UPAMD/P1823 General Goals

Adopted 3 August 2010 Rational from balloting added 7 Dec 2010

1. Life expectancy of 10 years for Standard

The life expectancy of this UPAMD standard is targeted for to be a minimum of 10 years. This may include a revision in 5 or 10 years as required by ANSI standard review processes. Products built to this standard will have a useful life well beyond that time. Reusability of products built to this standard make them durable goods instead of a disposable product.

2. Same connector for All device and adapter connections, if detachable cable.

All devices and connections will use the same connector. If the cable is made detachable for easy replacement, both ends will be the same for customer convenience and ease of use. Cables are not required to be separable from the power source, but may be. Power sharing among mission and business critical user is supported by the double ended, symmetrical cables.

Low cost replacement cables can also be readily available to replace damaged cables.

3. Power range >10W – 130W delivered power to device and is brand, model, and year agnostic.

Power adapter, power sources, may be built to any power capability within this specified range. Device, power sinks, will be designed to use power within this power range.

In the better designed current power adapter systems, the device will make use of the power available from the adapter it is attached to. A low power device will work with any adapter supporting its' power level or above. A high powered device will make the best decision for its own use of available power from a lower powered adapter, ranging from reduced operation to meet available power, extending currently available locally power or, in the extreme power level discrepancy, inform the user via indicator that there is insufficient power available to operate. Slow recharge of a large battery powered systems is possible even if operation is not. Devices with high surge power needs would not work with adapters not capable of its surge needs.

4. First adapter must work with last device and last adapter with first device. Standards Compatibility

Power adapters do not become obsolete. Enhanced capabilities may be incorporated in future versions of the UPAMD standard, with basic operations being continuously supported.

No adapter designed to UPAMD will become obsolete during the life of the UPAMD standard.

5. Adapter<->Mobile Device communications required for higher power - Safety <0.7W Non-Sparking.

This is a user safety issue. We must limit the stored energy, at connection and disconnection, available at the connector to below what is considered capable of creating an ignition spark in a combustible atmosphere. When the connector is properly mated to a compatible device the power can be increased without the potential of a spark. All portable equipment may be

used, and power sources connected, where natural gas, fuel vapors, possibly hydrogen, industrial gases, and other gas mixtures may be present. Oxygen rich environments or where supplemental oxygen is being used, along with flammable substances are now found in many homes as well as industrial environments.

Initial connection power is limited to below the power levels defined in ISO/IEC 60601-1 will reduce ignition potential and still provide sufficient power for communications. With initial communications, indicating mated connectors, the power can be raised to full adapter power. Disconnection also needs to be determined, and the power removed before the main power electrical contact is broken to prevent the inductively generated spark based on power flow. Newer power designs, such as the Apple power plug system, start with a low safe voltage and power level and increase to full adapter power as connection is known to be complete. Communications connections will be the last made and first broken to properly sequence the power delivery. Nominal connection and disconnection will be a safety power levels only. If the AC/DC source power is specified in the standard, soft start should be included to limit surge currents and prevent the AC arcing at the AC plug connector.

6. Standard designed to support Certification testing of adapter, device and cable

UPAMD is to support multiple generations of products. As such, each of the components must be able to be tested and certified individually. As part of the UPAMD effort, the criteria for the testing of the individual components must be included as part of the effort.

Testable components will be the power source, that may power one, or more, power sinking devices, the cable attached or separable, and the power sinking device attached to the cable. Testing for ports capable of both sourcing and sinking of power must also be designed for testing.

Testing criteria will be developed for these components to be tested, as sold, individually or in combinations.

7. Continuous communications growth to support growth of UPAMD capability.

Communications capabilities will initially be used to communicate the power level available from the power source. Device then adjusts its operations to meet the available power or indicates to the user that the power is really insufficient to do anything.

Advanced systems will be capable of power negotiations between the power source and each power user to optimize power distribution over a larger system with multiple loads. The ability to schedule power demand and usage will support the use of smaller, more efficient power sources feeding multiple devices.

Battery recharging can be done when energy is less expensive. Eventually Smart Grid information may be conveyed to the powered device.

Many power systems may have local energy storage to manage.

Enhancements of the communication system will allow extend use of the basic system with newer communication messages added over time. Intelligent design of the communications system will serve the current need and allow growth.

8. Basic power delivery mechanism to support non-battery and battery powered devices

Any battery included in a device is controlled by that device. UPAMD has no knowledge a battery is included in the device, only how much power is requested. It assumes no power is in the device and supplies the power for the communications as part of the startup procedure. UPAMD is a basic power delivery system for mobile, portable, devices.

9. Device may be capable of being a source as well as a sink of power.

Any device or port may act to supply power or source power at different times to optimize critical applications.

Mission and business critical systems may be supported by the transfer of power from a less critical system to a more critical system through the direct connections of devices designed to both sink and source power.

Detachable cables with identical connectors on both ends and the communications facilities make this possible. This also supports energy storage in a power hub. (UPS battery)

This capability supports the use of higher powered peripherals, such as projectors and printers, from a portable device with internal power storage such as a fuel cell, battery, or other storage mechanism.

10. Make independent of rapidly changing technology.

Technology is changing rapidly in all aspects of this environment. Battery technology seems to have a 3 year life cycle with different chemistries required for different applications. Silicon technology, and its follow-on technology, will continue to change as rapidly as the smart inventors can drive it.

Printers, projectors, game consoles, instrumentation, entertainment, monitoring systems, display and sound systems will not have local power storage for other than config memory. The most reasonable assumption is that power systems for portable, mobile devices, in the 10-130W power range will be needed for the foreseeable future.

11. Consider future mobile device design options; smaller profiles, shapes, and mounting positions.

Consider the ultra thin netbooks and notebooks going down in thickness and the slate style products growing in power needs beyond what can be accomplished with the 5V MicroUSB connector. This needs a new connector in the 5-6mm wide range to fit in the edge of the device. If the connector is shallow it may be considered for mounting on surfaces other than the edge.

Consideration should be given to connector of the style used on the MacBook/Air series products with spring-pins (pogo-pins) for high reliability, in the 100,000 cycle range.

The connector latching system should be capable of both soft and hard latching modes. Both the hard latch connector system for critical, less accessible connector positions, and soft latching connector system for trip resistance for public area use. Connector should withstand Pollution type 3 for office, shop floor, and limited outdoor use and have water seal. Creepage and clearance should support up to 60VDC (SELV).

12. Connector must not mate with any current designs – no confusion.

A wide variety of existing power adapter plugs is available in the marketplace. This is uncontrolled with respect to the voltages or power available from any existing adapter. Similar, intermixable, power plugs with voltages from 5V to 48V on the connector. An example is Dell and HP connectors which inter-mate but are not compatible power sources. Prevention of interconnects that can cause harm to the user or user equipment will require the use of a connector that does not inter-mate with current products or is inhibited by communications requirements from operating.

13. Apply KISS principle – Keep It Simple Stupid within the other goals.

