

INTRODUCTION

Field upgrading an existing PoE based IP Phone is a desired capability for many Enterprise customers. This technique allows the IP PBX consumer to buy the phone with a needed initial feature list and then re-use the same platform and add upgrades, as needed per phone, over time.

Such an upgrade capability may require the original IP Phone to change its PoE power usage profile, for example go from PD Class 2 to PD Class 3. But what if extensive installation knowledge, time, or costs are required to make the upgrade? New IP Phone features may be highly desired but if upgrading leads to either burdensome field service costs or extensive Enterprise IT involvement they will likely not be justifiable. Another non-starter is an expensive premium in the original IP Phone platform to provide this upgrade capability.

An ideal design solution provides the IP Phone platform a flexible, cost effective, PoE PD with features already built in for *PD Initiated IP Phone Upgrades*.

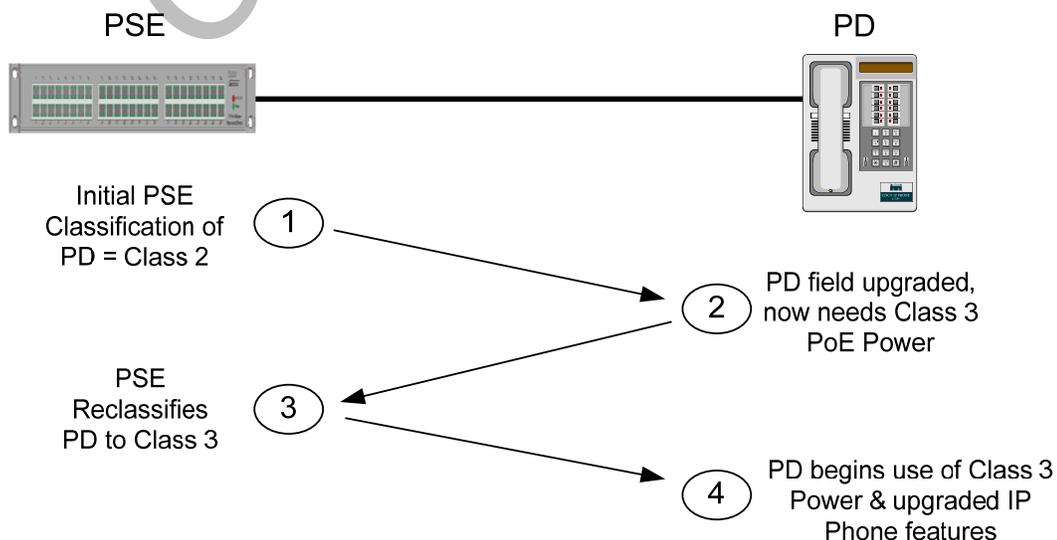
PD INITIATED POE POWER RECLASSIFICATION

The steps from original to upgraded PoE IP Phone should be simple:

1. The PD is operating as a valid PoE Device (Classes 1 & 2 are typical for IP Phones).
2. The user adds a hardware upgrade to the phone that will require a higher PD Power Class for the resulting (phone + upgrade) IP Phone.
3. The PSE re-classifies the upgraded phone.
4. The upgraded IP Phone starts using the new PD Power Class.

Step 2 often involves simple installation of a docking upgrade to the original phone. During such an installation manually disconnecting the IP Phone from the IP network by the user is not desired; but the upgraded IP Phone should not use the new features until the new higher power PD Class is established by the PSE.

Typical PD Initiated PoE Power Reclassification Application



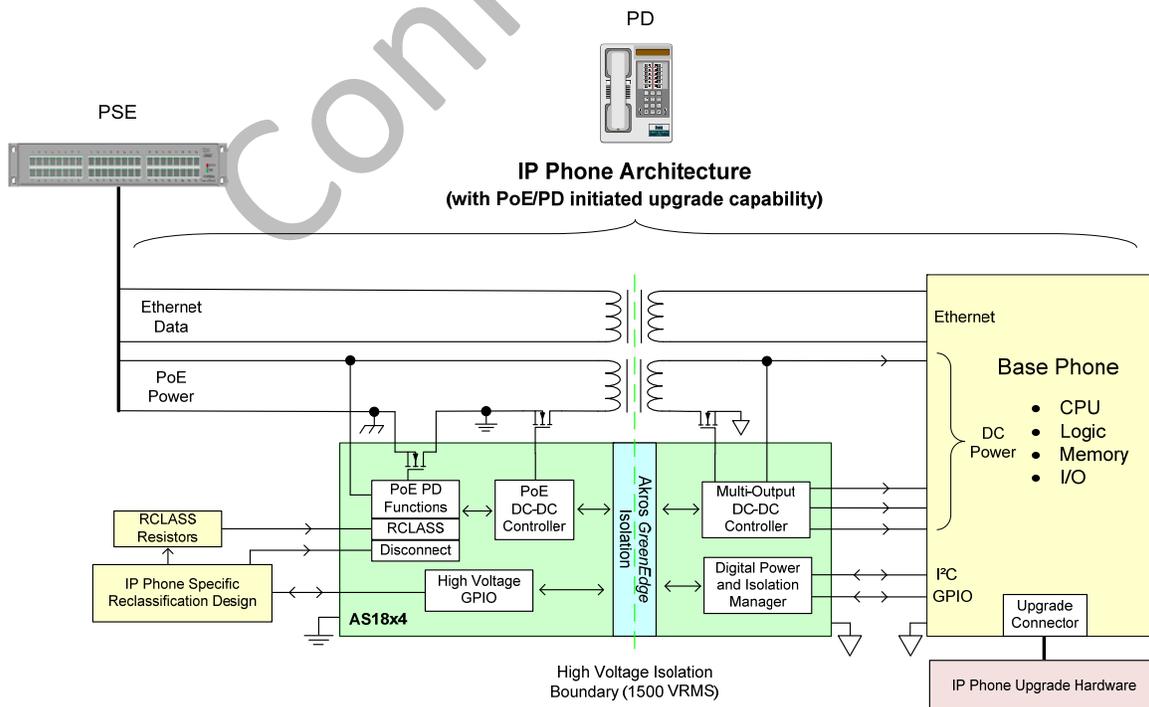
THE AKROS SOLUTION

There are several key design aspects of any solution for PD initiated power reclassification:

- Reclassification is done in hardware circuitry on the High Voltage side of the IP Phone power plane, but is initiated by the IP Phone CPU on the Low Voltage (secondary) side power plane.
- For the PD to force the PSE into a reclassify state, the PD needs to initiate a PoE disconnect and yet keep the desired new reclassification state for use upon reconnection.
- The IP Phone should not use the additional requested power until the PSE has made it available, so the CPU should be able to receive such an acknowledgement from the PD circuitry.

As shown in the figure (below) the AS18x4 provides the feature set for such a design:

- The internal High Voltage isolation of the AS18x4 provides a cost effective means for signaling from the CPU to the reclassification circuitry.
- The AS18x4 family provides both I²C and GPIO connections to the CPU, either of which can signal across the Isolation. This gives design flexibility to suite the specific I/O requirements of the IP Phone platform design.
- The High Voltage GPIO of the AS18x4 family has bi-directional signaling, providing an acknowledgement path back to the CPU of a successful PoE reclassification.



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