Annex H. Internal Device Physical Interface

H.1 Overview

The Cable PHY Layer Specification described in section 4 is designed for external box-to-box applications. (An example would be a CPU, printer and video camera interconnected with a 1394 interface in which the CPU and printer are powered from different AC outlets while the camera takes power from the 1394 cable.) The external cable provides power to all PHYs on the bus so that they can maintain their bus repeater capability even if the node local power is off. To accommodate different power domains (different AC power sources), each node must provide isolation between the node local power and the external cable power. The external environment requires mechanically strong shielded cables and connectors.

An internal device does not have the same design criteria as an external box-to-box application. Internal devices, (such as DASD hard files), are optimized for low cost, low power, minimum components and minimum package size. Internal devices share a common power domain with other devices packaged within a box and do not require mechanically strong shielded connectors and cables, Internal devices do require packaging options such as hot-plug, auto-dock, blind-mate and various connector methodologies such as cable or board attachment with surface mount, card edge, etc. connector systems.

A goal of the internal device interface is to allow implementation options for both the device implementer and the system user. These options enable 1394 internal devices to accommodate a wide range of applications in a cost effective manner. Device options include a second port which can be configured as either as a repeater (bus) or as a second independent port (dual path). Packaging options include cable attachment, board attachment or a combination of the two. Pins are allocated in the internal device connector to support these options.

Because the physical interface and electrical requirements for internal devices differ from external box requirements, a different physical interface is required.

H.2 Electrical Interface Assumptions For Internal Devices

H.2.1 Power Requirements

It is assumed that a single external node will support multiple internal devices. The external node will provide the power isolation for the box with respect to other external nodes. The internal devices will share a common power domain within the box eliminating the need for power isolation for each internal device.

Internal device power is regulated +12V, +5V and +3V at 1.5 Amps. Connector pins are assigned for all three voltage levels but it is a box option to select which voltage levels will be provided. (Note that most devices use only one or two of the specified voltage levels.) Providing regulated voltage to the devices eliminates the need for a voltage regulator as described for the external box interface.

(* NOTE: Review 1.5 Amps. It's a number grater than 1! *)

It is assumed that fewer ground pins are needed than voltage pins. This is based upon the assumption that not all voltage pins will be utilized by any single device.

It is assumed that their is no need for separate voltage and ground pins for the signal and “motor” operation. This is based upon the realization that most devices connect the grounds and power signals together on the device.

Since devices are not required to implement power isolation, separate power domains within the device are not required. This allows a higher level of device electronic integration.

H.2.2 Signal Requirements

Every 1394 device shall implement at least one port referred to as the Primary Port. A device may optionally implement a second port referred to as the Secondary Port. The Secondary port may be configured as a bus repeater (as defined for the cable environment), or as a second independent 1394 bus (used for high availability dual path support). The method of selecting either optional configuration is beyond the scope of this standard.

Each port consists of five signals consisting of the pair of differential signals defined to the cable environment and one signal ground. A sixth pin location had been considered for keying the connector but keying is now supported by the connector shell itself. Therefore, the sixth pin location could be used for +5V to support a low cost solution for low power files which do not intend to implement the larger multi-bay connector. (Note that the use of the sixth pin for +5V is offered

for consideration only.)

To support hot-plugging of devices, the ground pin shall make before the signal pins.

H.2.3 Miscellaneous Signals

A set of vendor unique pins, reserved pins and an LED indication pin are defined. It is expected that the vendor unique pins will be used during manufacturing.

(* NOTE: This needs to be discussed yet *)

Table H-1 – Internal Device Primary and Secondary Port Pin Allocation

Pin #s	**Signal Name**
1,2	TPA
3,4	TPB
5	Signal Ground
6	Key (maybe 5V)

Table H-2 – Internal Device Power Connector Pin Allocation

Pin #s	**Signal Name**
1,2	3.3 V
3,4	5 V
5	12 V
6,7,8	Power Ground

Table H-3 – Internal Device Misc. Connector Pin Allocation

Pin #s	**Signal Name**
1	Drive Active LED
2	Motor Auto/Manual Start
3,4,5	Reserved for P1394
6,7,8	Vendor Unique

H.2.4 Connector Requirements

The internal device connector need not be shielded since it is intended for inside cabinet applications.

(NOTE Add mechanical stuff here *)*