# HP-HIL Cables & Connectors

HP-HIL (HP Human Interface Loop) was a proprietary interface designed by HP for 9000 series computers. It is a four-wire serial interface with capabilities similar to the modern USB interface. This note relates to the cables and connectors only. The HP-HIL system design is described in the *HP-HIL Technical Reference Manual*, part no. 45918A, published Jan 1986. HP-HIL was used to connect in a linear chain (see Fig. 1) a system host with up to seven peripherals such as keyboards, mice, touch-screen sensors, button boxes and dial boxes.
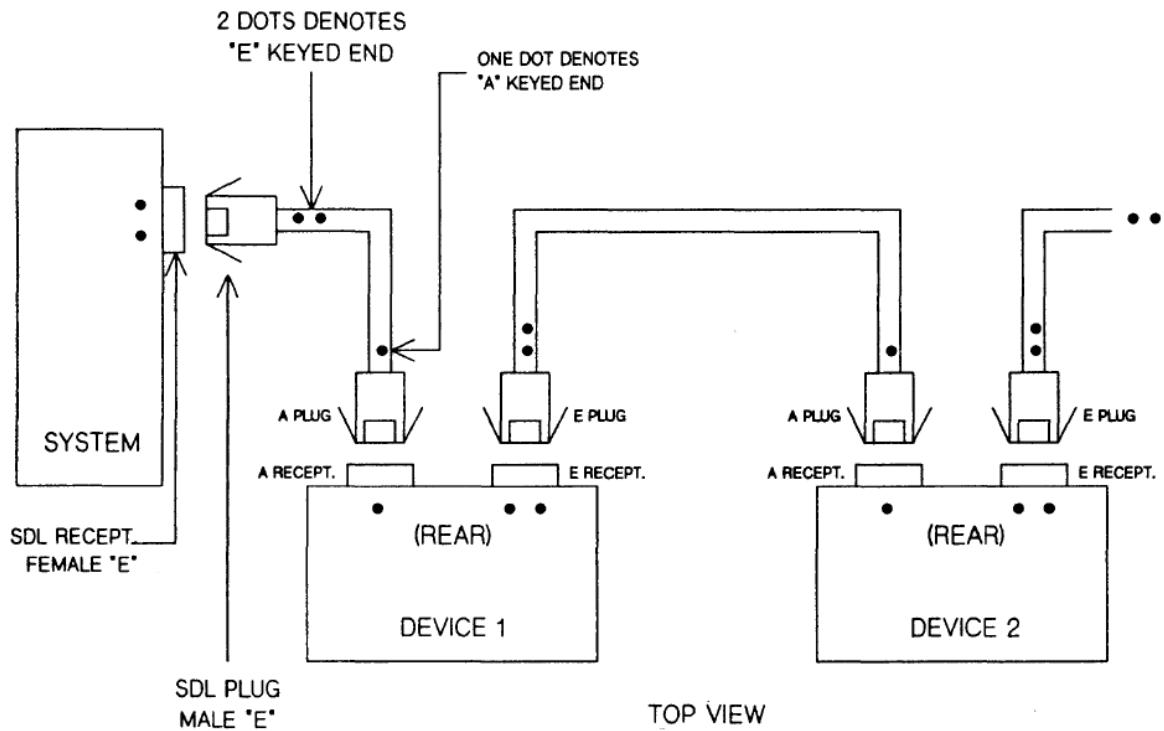
Fig.1 HP-HIL system connectivity

HP-HIL uses a flat four-core cable with full foil screening and this was available in both straight and coiled form, the latter typically used to connect a keyboard to the system processor unit (SPU). Approximate external cable dimensions were 5 mm x 2 mm and conductors were 24 AWG copper. Shielded Data Link (SDL) crimp connectors designed by Amphenol (now TE Connectivity) are used and these come in two polarities: A and E. The two look almost identical but differ in the spacing of the key slots seen at the front-bottom edge in Fig. 2. To aid identification, HP designated the A-type plug and receptacle by a single large dot (●) usually marked on the cable adjacent to the male connector and on the chassis of the SPU or peripheral adjacent to the female receptacle. Similarly, the E-type plug and receptacle were designated by two large dots (●●). The SPU typically had a single type E receptacle and most peripheral devices has both a type A (●) and a type E (●●) receptacle, allowing the peripherals to be connected in a chain as seen in Fig. 1. Mice had an integrated cable terminating in a type E (●●) male plug. In this way, a mouse would be placed at the end of the HP-HIL chain.
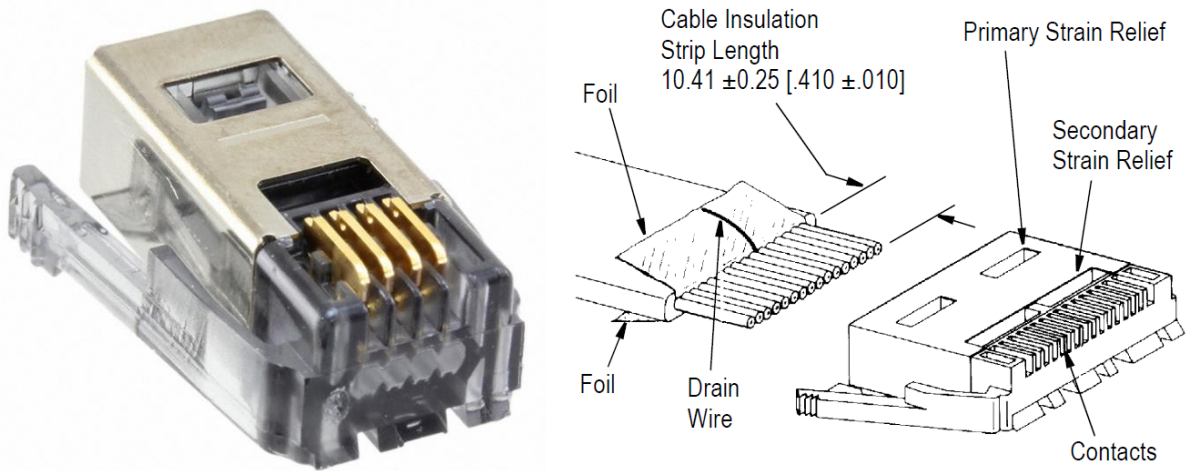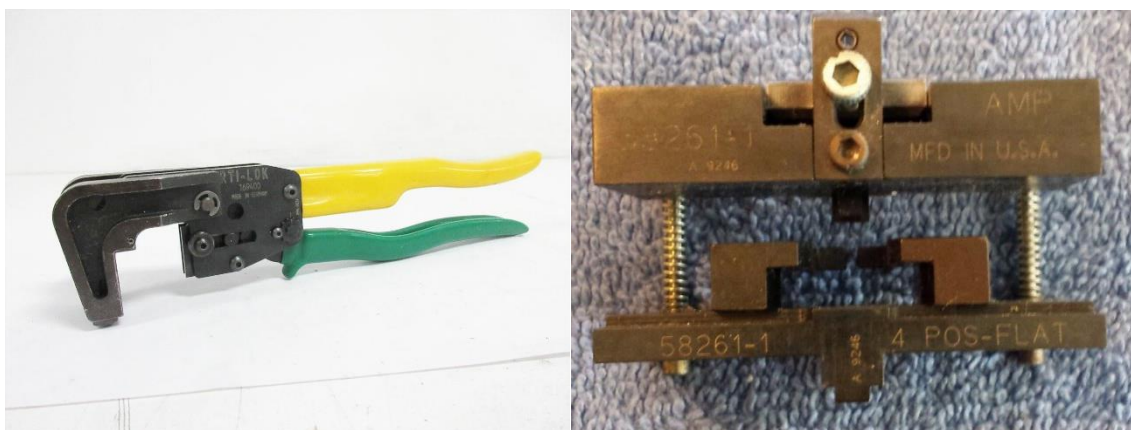
Fig. 2. Left: 4-way SDL Type A plug. Right: Assembly illustration for a 16-way SDL plug.

The SDL connectors are still available from TE Connectivity distributors and part numbers are tabulated below. A crimping tool and die are available (see Fig. 3) but these are extremely expensive, even second hand. Use of the crimping tool and die is described in TE Connectivity Instruction Sheet 408-9113 and 408-9115, available on their website. It is possible to crimp the connectors manually (without the proprietary tooling) by pressing down on each pin in turn with a flat blade screw driver, being careful not to crush the plastic guides between the pins. The primary and secondary strain relief grips can be crimped in a similar way. Although screened cable is specified, ordinary unshielded coiled telephone-handset cables appear to work for connecting a keyboard with an SPU.

Table 1. Part Numbers

Item	TE Connectivity Part Number
Type-A plug, 4 way	1-1761184-1
Type-E plug, 4-way	5-1761184-1
Crimping tool (without die)	58194-1
Crimping die (requires crimping tool)	58261-1

Fig. 3. Crimping tool and die