

### Features

- **CABLE AND PARALLEL PORT ADAPTER FACILITATE IN-SYSTEM PROGRAMMING OF ISP™ DEVICE FAMILIES**
  - Simplifies In-System Programming
  - Ideal for Design Prototyping and Debugging
- **SUPPORTS ALL DIGITAL ISP DEVICE FAMILIES**
  - ispLSI® Families (1000, 1000E, 2000, 2000E, 2000VE, 2000V, 3000, 5000V, 6000, 8000 and 8000V)
  - ispGAL® Family
  - ispGDXTM and ispGDXTVM Families
  - ispGDS™ Family
- **SUPPORTS ANALOG ispPACTM PRODUCT FAMILY**
- **EASY-TO-USE CONNECTORS**
  - 25-Pin Adapter Connects to PC Parallel Printer Port
  - 6' Cable Offers Printed Circuit Board Interface:
    - AMP Connector (8 Position, .100 Inch Center Spacing)

### Cable Specifications

The ispDOWNLOAD Cable is 6' in length. One end is connected to the standard parallel port of a PC with a DB25 connector. The other end consists of an in-line row .100" header with eight interface connections. Vcc and ground must be applied at the cable end connected to the target board. See Figure 1 for cable pinouts.

### ispDOWNLOAD Cable for the PC

#### Digital Product Families

The ispDOWNLOAD Cable for the PC is designed to facilitate in-system programming of all Lattice Semiconductor ISP devices on a printed circuit board directly from the parallel port of a PC. With in-system programmability, hardware functions can be programmed and modified in real-time on the system board to provide additional product features, shorten system design and debug

Figure 1. ispDOWNLOAD Cable In-System Programming Interface for the PC (All Digital and Analog Products)

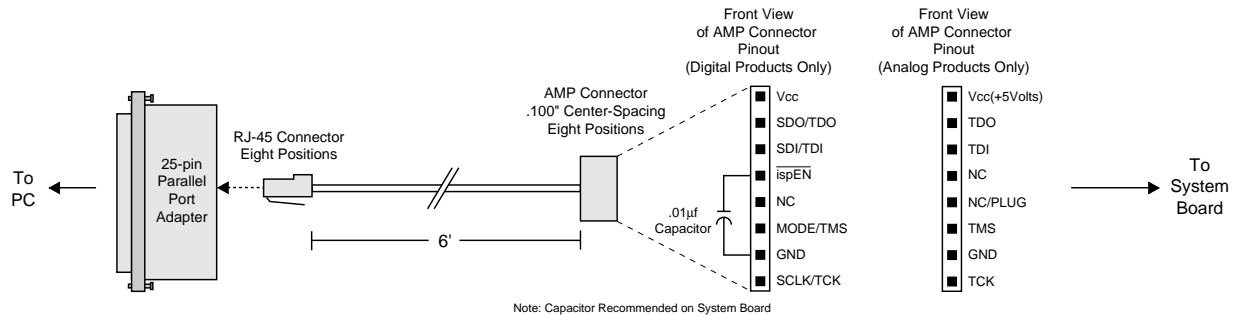
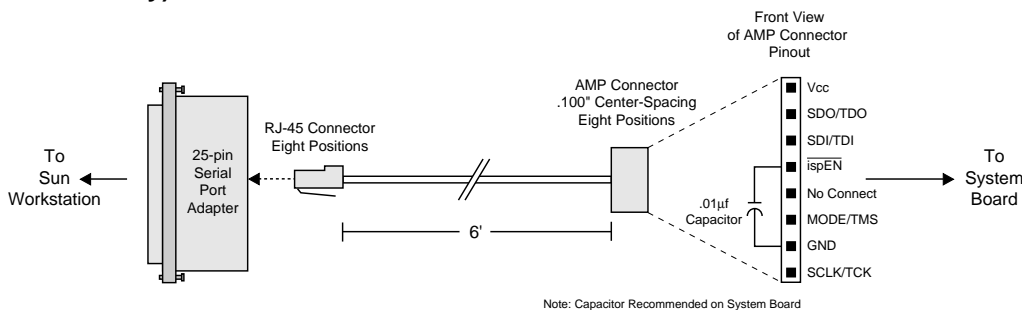
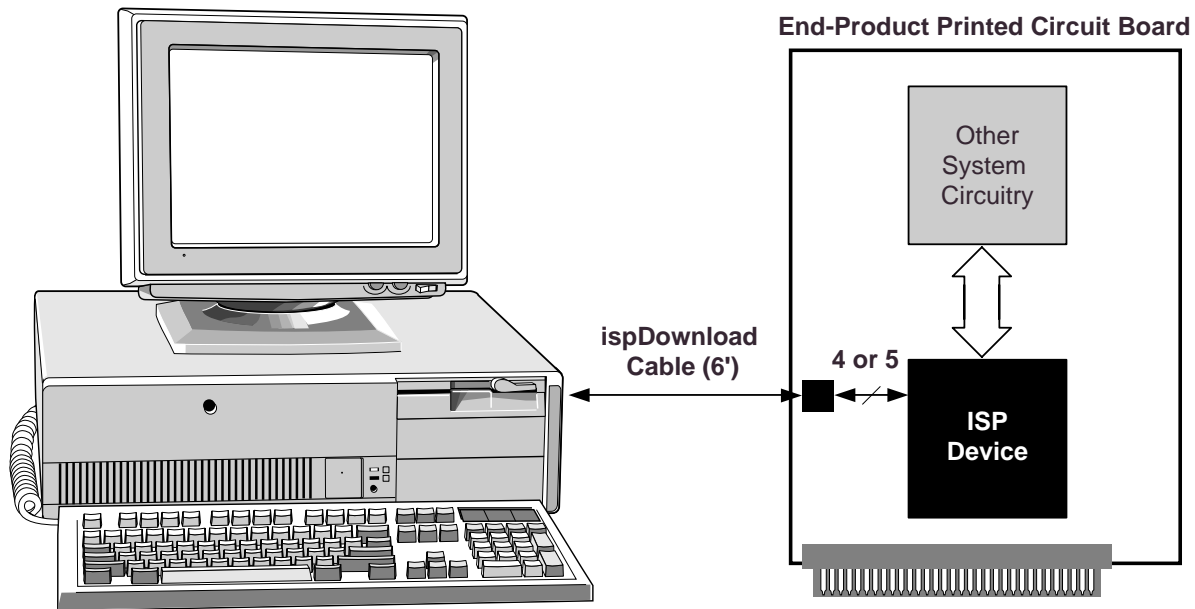


Figure 2. ispDOWNLOAD Cable In-System Programming Interface for the Sun Workstation (Digital Products Only)



**Figure 3. Configuring In-System Programming from a Remote System**



cycle time, enhance product manufacturability and simplify field upgrades. After completion of the logic design and creation of a JEDEC file by a logic compiler such as the ispEXPERT™ Compiler and Systems or ispGDX Development System, Lattice's ISP Daisy Chain Download software programs devices on the end-product board by generating programming signals directly from the parallel port of a PC which then pass through the ispDOWNLOAD Cable to the device. With this cable and a connector on the board, no additional components are required for programming. The ISP Daisy Chain Download software automatically generates the appropriate ISP command, programming address and data from the JEDEC fuse map information. ISP Daisy Chain Download software is included with all Lattice design tool products.

### Analog Product Families

Using PAC-Designer™ software, the design is entered in a graphical user interface (GUI). Once the design is completed, the user can immediately download the configuration to the ispPAC device while it is soldered to the board. This is accomplished using the ispDOWNLOAD Cable connected to the PC parallel port. The software automatically generates the necessary timing and signals for the JTAG interface to the ispPAC device.

This quick and efficient implementation allows designers immediate access for the design checkout and debug.

Updates can be made at any time using this download method. Multiple JTAG devices can be daisy chained together in a JTAG chain. The data is shifted through each device with the appropriate programming commands and data.

Programming of ispPAC products can be done with ISP Daisy Chain Download software using the Serial Vector Format, (SVF) option. Programming can also be executed directly from within the PAC-Designer software.

### ispDOWNLOAD Cable for Sun Workstation

The ispDOWNLOAD Cable for the Sun Workstation provides a quick and easy means for programming all Lattice ISP digital logic devices from a Sun Workstation. Setting up the workstation ispDOWNLOAD Cable is as simple as connecting the serial interface adapter to the RS-232 port of the workstation and connecting the ispDOWNLOAD cable assembly to the target ISP system.

The serial interface adapter contains an embedded controller that handles programming commands from the host workstation to the target system and processes them for proper ISP operation. Additional features of the serial interface adapter include:

- Automatic baud rate detection for 300 baud to 115,200 baud operations

- Operational at supply voltages of 3.3V or 5V
- Standard Lattice ISP programming interface and ispJTAG™ interface (IEEE 1149.1) support
- RJ-45 interface jack for easy ISP cable assembly replacement
- Compact size and low power requirements
- Easy interface to the Lattice ISP Engineering Kit Model 100 for single ispLSI device programming

The ispDOWNLOAD cable assembly provides an interface between the ISP signals from the serial interface adapter and the target ISP system. The features of the ispDOWNLOAD cable assembly include:

- Six feet of eight-conductor flat cable with an RJ-45 connector on one end and an eight-position female header assembly on the other end
- RJ-45 connector for reliable and easy interfacing to the serial interface adapter
- Eight-position female header connector with .10" pin spacing for quick and low-cost interfacing to ISP target systems with a mating header pin strip. Keying is provided on the header connector for proper interfacing orientation
- Header connector assembly with super flexible wiring for durability

## Technical Support Assistance

### Digital Products

Toll Free Hotline: 1-800-LATTICE (Domestic)  
International: 1-408-428-6414  
FAX: 1-408-944-8450  
E-mail: [ispLSlapps@latticesemi.com](mailto:ispLSlapps@latticesemi.com)

### Analog Products

Toll Free Hotline: 1-888-477-7537 (Domestic)  
International: 1-503-268-8000  
FAX: 1-503-268-8037  
E-mail: [ispPACs@latticesemi.com](mailto:ispPACs@latticesemi.com)

## Product Ordering Information

Product Description	Part Number
ispDOWNLOAD Cable (PC)	pDS4102-DL2
ispDOWNLOAD Cable (Workstation)	pDS4102-WS