

# DP Command Set

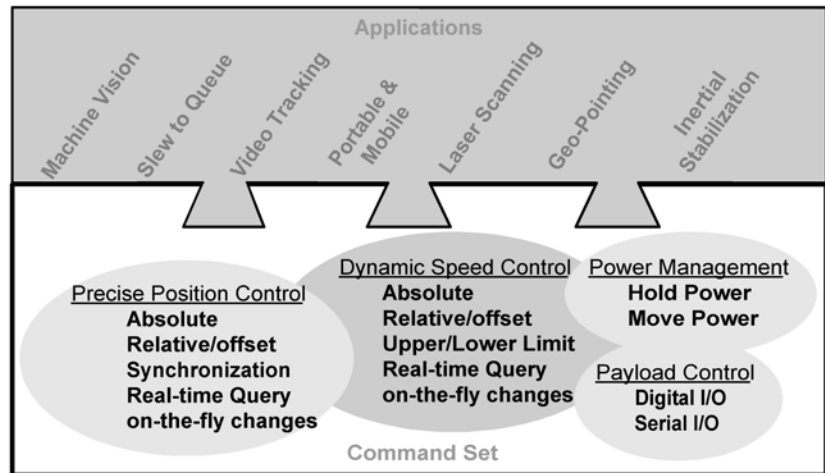
## Precise Control with Simplified Development

### A Universal Command Set Proven in Many Applications

Laser scanning, dynamic antenna alignment, mobile robot vision, automated video tracking, inertial-stabilized camera, laser target designator, airborne camera, sun tracker, automated parts placement, radar-queued port monitoring - all these are applications where the DP Command Set has proven successful. The generality, flexibility, and completeness of this platform provides assurance that your application can be implemented accurately and efficiently. The DP Command Set protocol operates in both ASCII and binary modes providing both simplicity of use and optimal performance.

### Reduce Development Time, Cost and Risk

Developing a complex sensor or communications applications from encoders and motor signals is time consuming and error prone. The DP Command Set provides a proven platform that you can build on. It provides high-level commands so that development efforts can focus on application-specific functions. Applications developers, systems integrators, and OEMs can build value quicker, and reduce development time, costs, and risk.



### Configurable, Flexible, and Reliable

The DP Command Set offers families of commands for absolute and relative position control, dynamic speed control with on-the-fly changes, power management, and payload control functions. In addition there are several unique features that cut across the command set including:

- **Real-time** - Precise kinematic control; Serial commands to over 60 Hz.
- **Configurable** - High degree of software configurability from the application interface - adapts to new or changing requirements.
- **Flexible** - Absolute and relative position commands; Velocity and acceleration control; Payload I/O.
- **Reliable** - Fully embedded controllers designed for always-on, 100% duty-cycle operation - proven in 100's of applications.

### Example: High-Speed Target Tracking

We consider dynamic target tracking as an example to illustrate the power of the DP Command set. Video tracking is used to detect and follow a target of interest. Target position and velocity is calculated in image coordinates. The tracker uses velocity and acceleration commands to command the pan-tilt to appropriate levels to match target motion. Position commands are issued at up to 60 Hz to move the pan-tilt to target position. The feed-forward commands are computed from the known kinematic motion profile and are added as part of the control-law. This hybrid position/velocity control provides robust tracking under a wide range of conditions.

### See Also

- PTU-D46 and PTU-D300 User's Manual (command set)
- PTU C Language Programmers Interface (PTU-CPI) (Open C API)
- Geo-Pointing Module (PTU-DGPM) (Ethernet, DPoIP interface formats)

# Application Connectivity

## Multiple Interfacing Options

### Open Architecture, Multiple Interfaces

Directed Perception products include multiple control interface mechanisms to meet the widest possible range of application needs, and provide flexibility to system developers, integrators, and OEMs. The DP Command Set is supported over a variety of network interfaces and architectures including:

**Serial** (RS-232, RS-485) - Both binary and ASCII forms of the DP Command Set are supported by serial

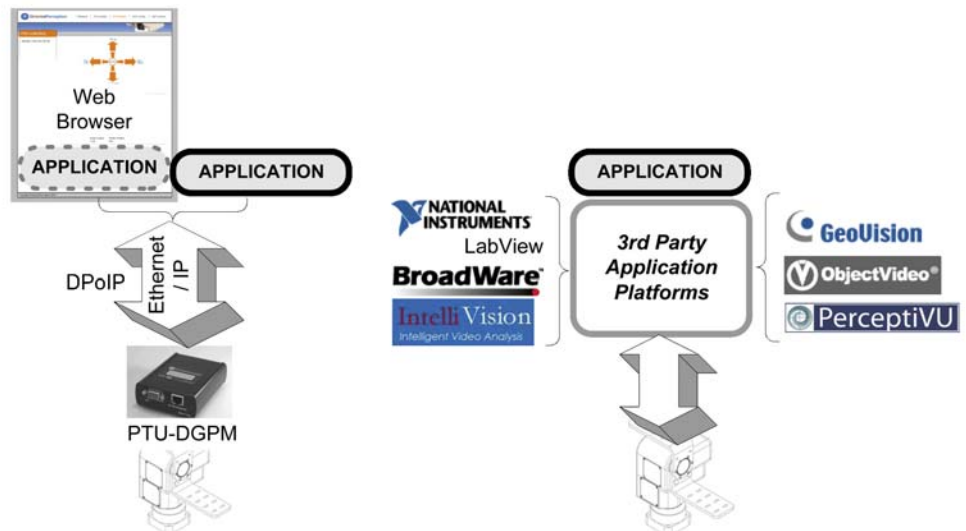
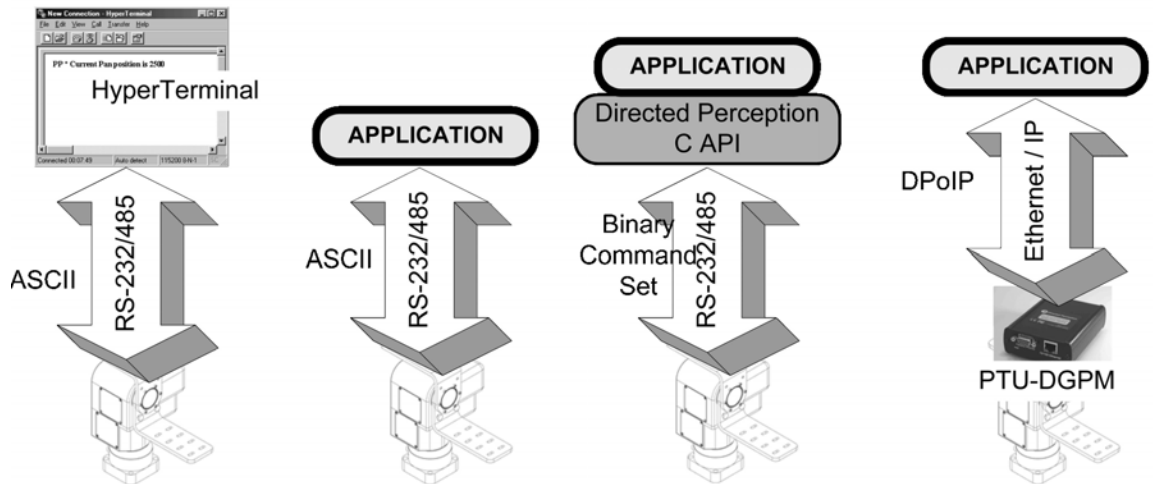
interfaces built into all Directed Perception devices, providing access from any computing platform or device. Popular 3rd-party terminal emulation programs such as HyperTerminal can be used to type commands directly to the device and view responses. This is a powerful and flexible tool for application development and test. Custom applications can use the documented ASCII form of the DP Command Set to directly control Directed Perception devices over serial interfaces.

**Directed Perception C API** - The binary form of the DP Command Set is available via the Directed Perception C API. This is ANSI C source code that can be compiled into applications on virtually any operating system/CPU platform to provide high-performance control over serial interfaces. The C API is recommended for applications that require command update rates greater than 10 per second, and to simplify integration of control with custom applications.

**Ethernet** - The DP Command Set can be used over Ethernet with the Geo-Pointing Module to allow access by any application over an IP-based LAN/WAN connection. Both traditional and browser-based applications can operate over Ethernet using this feature.

**Web Browser** - The Geo-Pointing Module includes a set of built-in web pages to allow graphical configuration and control of connected pan-tilt devices from any web browser.

**3rd Party Applications** - A growing set of 3rd party applications include built-in support for control of Directed Perception devices.



Specifications subject to change without notice.