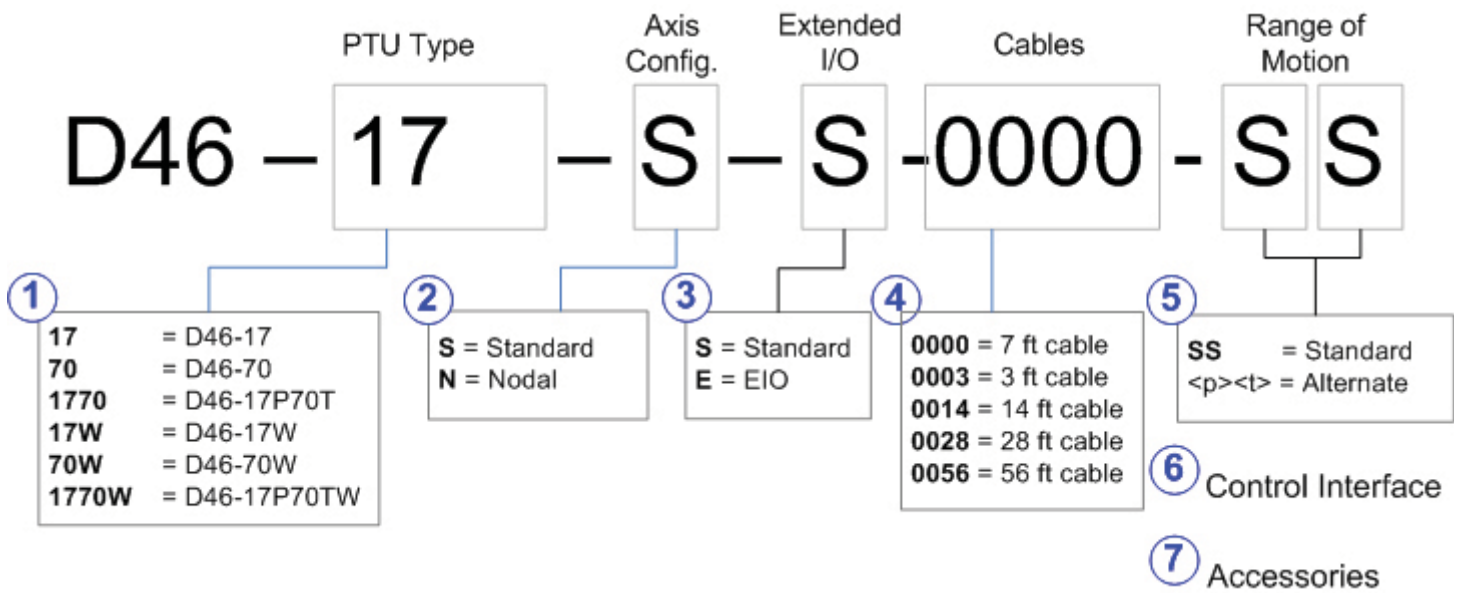




PTU-D46: Quick Configuration Guide

This guide includes details on configuration options and accessories for the model PTU-D46 pan-tilt units. This guide will walk you through the configuration. Other relevant documents include:

- PTU-D46 Datasheet
- PTU-D46 User Manual
- Pan-Tilt Unit Command Reference Manual



The following are the configuration choices and accessories available for this model:

- 1 The D46 comes in three different models that differ in axis resolution and maximum speed: D46-17, D46-70 and D46-17 P70T. Each of them can be weatherized if needed.
- 2 Standard or nodal configurations, which allows payload to be located at center of rotation of both axes, are available.
- 3 The D46 can be ordered standard or with extended I/O controller.
- 4 The cable from the D46 to the controller box is available in lengths of 3 ft, 7 ft (standard), 14 ft, 28 ft, or 56 ft.
- 5 Standard ranges of motion, or alternate ranges of motion are available.
- 6 Pan-tilt control options include ASCII or binary command set, Ethernet connection, and joystick or trackball.
- 7 Available accessories include power supply, side bracket, controller mounting kit, and pan-tilt control accessories.

1 Pan-Tilt Model

D46- 17W - S - S -0000 -S S

The D46 is available in three different versions as follows:

Model Number	Pan Axis Resolution	Pan Axis Maximum Speed	Tilt Axis Resolution	Tilt Axis Maximum Speed	Rated Payload
D46-17	0.013°	300° / second	0.013°	300° / second	6 lbs
D46-70	0.003°	60° / second	0.003°	60° / second	9 lbs
D46-17P70T	0.013°	300° / second	0.003°	60° / second	9 lbs

D46 models come standard or with additional weatherization for outdoor use. The following modifications are part of this option, and result in an IP65 rating for the pan-tilt head:

- Clear epoxy coating added to motors
- Silicone sealant around screws and cable attachments
- Rubber seals and plastic washers around knobs
- Gasket sealing around outside edges of motors
- Stainless steel screws
- Interfacial seal on Pan-tilt head connector

Note: The pan-tilt controller is not weatherized and should be housed in an appropriate enclosure for outdoor use.

Ordering:

D46-17-	D46-17
D46-70-	D46-70
D46-17P70T-	D46-17P70T
D46-17W-	D46-17, weatherized
D46-70W-	D46-70, weatherized
D46-17P70TW-	D46-17P70T, weatherized

NOTE: Please refer to technical datasheet for complete specifications.

2 Axis Configuration

D46- 17W - S - S -0000 -S S

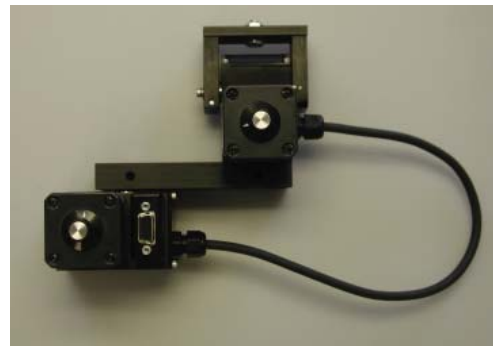
The D46 comes standard as shown or in the nodal (gimbal) configuration. The nodal configuration allows the payload to be mounted at the center of rotation of both pan and tilt axes, allowing payload movement to be programmed as pure rotation in both axes (no translation).

NOTE: Nodal units cannot be converted to standard units after manufacture.



Ordering:

D46-___-S Standard



Ordering:

D46-___-N Nodal

3 Extended I/O Controller

D46- 17W - S - **S** - 0000 - S S

The controller unit of the D46 can be extended to allow for serial devices to also be used for pan-tilt control, such as joystick or trackball.

For more information refer to section 6, pan tilt control interface.

Ordering:

PTU-D46_-_S-E	"Extended I/O (EIO) Option ..."
PT-EIO-JOY-DB	"Joystick for use with EIO option..." OR
PT-EIO-TRACKBL	"Serial trackball for use with EIO option..."

4 Cable Length

D46- 17W - S - S - **0000** - S S

The PTU-D46 connects to the controller box with a cable which can be ordered in a variety of lengths up to 56 feet, depending on the application requirements. The standard cable length is 7 ft. Alternate cable lengths can be ordered to replace this standard cable. Additional cables may be purchased if requirements change.



Cable Upgrades

Ordering:

D46-___-___-00**-___ <* see below>

Example: D46-17-S-S-0014-SS = upgrade to 14 ft cable

Available Cable Upgrades

0000	standard 7 ft controller cable
0003	3 ft controller cable (replaces 7 ft cable included with PTU)
0014	14 ft controller cable (replaces 7 ft cable included with PTU)
0028	28 ft controller cable (replaces 7 ft cable included with PTU)
0056	56 ft controller cable (replaces 7 ft cable included with PTU)

Additional Cables

Ordering:

PT-CABLE-CE-* <* see below>

Example: PT-CABLE-CE-14 = additional 14 ft cable

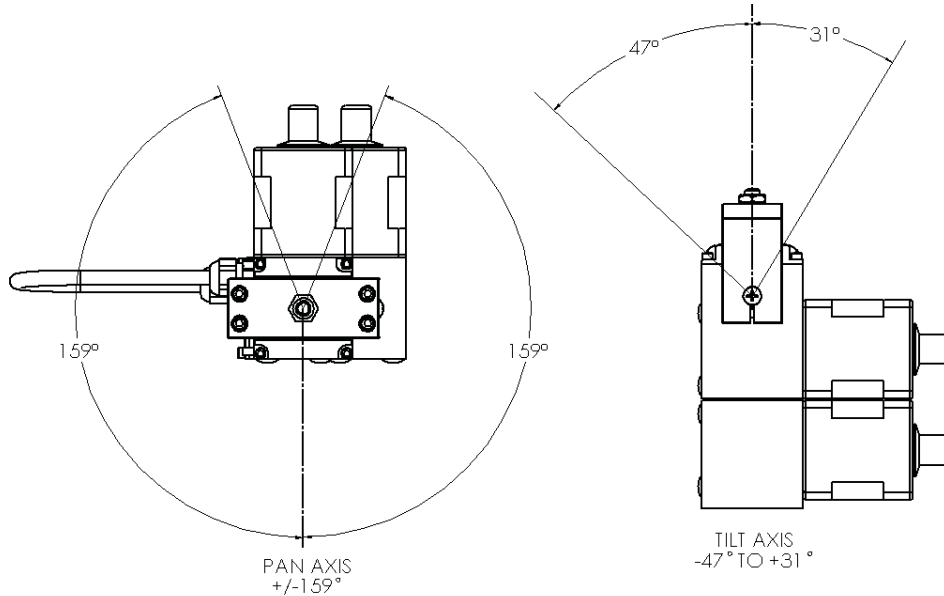
Available Additional Cables

PT-CABLE-CE	additional 7 ft controller cable
PT-CABLE-CE-3	additional 3 ft controller cable
PT-CABLE-CE-14	additional 14 ft controller cable
PT-CABLE-CE-28	additional 28 ft controller cable
PT-CABLE-CE-56	additional 56 ft controller cable

5 Ranges of Motion

D46- 17W - S - S - 0000 - **SS**

The PTU-D46 calibrates automatically on power-up using an internal precision limit detection system. In order for the unit to calibrate successfully, it must explore the full range of motion in both axes. If this calibration sequence may potentially interfere with surrounding equipment, modified pan and tilt ranges can be specified at time of order. The calibration sequence can be software controlled, and suppressed at power up. However the sequence must be executed before absolute position commands will be accepted. Range of motion limits must be set at the factory and cannot be changed by the user.



Pan axis
+/- 159°
+/- 180° with limits disabled

Tilt axis
+31° to - 47°
+31° to - 80° with limits disabled

Pan Range Options

Ordering:

D46-___-___-0000-_*_ < * see below >

Example: D46-SS-S-S-0000-AS = +005/-005 Pan

Available Pan Range Values

S	+159 / -159 (standard)
A	+005 / -005 Pan
B	+010/-010 Pan
C	+025 / -025 Pan
E	+035 / -035 Pan
F	+090 / -090 Pan
Z	Custom Pan (specify, requires engineering approval)

Tilt Range Options

Ordering:

D48-___-___-0000-_*_ < * see below >

Example: D46-SS-S-S-0000-SC = +025/-025 Tilt

Available Tilt Range Values

S	+031 / -047 (standard)
A	+005 / -005 Tilt
B	+010/-010 Tilt
C	+025 / -025 Tilt
E	+035 / -035 Tilt
G	+000 / -040 Tilt
Z	Custom Tilt (specify, requires engineering approval)

6 Pan-Tilt Control

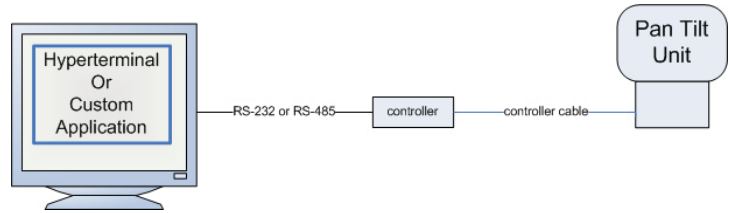
The PTU-D46 supports serial, ethernet, and joystick control interfaces enabling a wide range of system control architectures. Options are described below.

ASCII Command Set

The pan-tilt can be controlled over the built-in serial port (RS-232 and RS-485) using simple ASCII commands documented in the Command Reference Manual. This can be done using a terminal program such as Hyperterminal, or from a custom application. Performance using the ASCII command format is approximately 10 commands/second.

Ordering:

<included in all configurations>

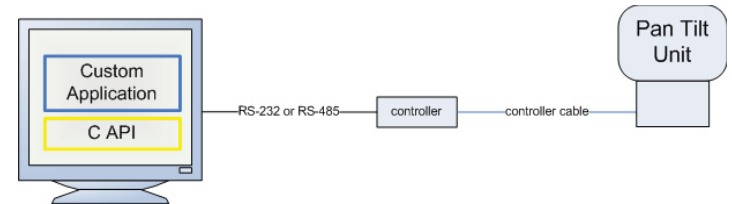


Binary Command Set (C API)

In addition to the ASCII format, the pan-tilt will accept binary forms of the commands. These binary formats are supported via our C Language Interface library (PTU-CPI) which is provided as ANSI C Source Code which can be compiled into your application on many computing platforms (CPU/OS). The binary command format supports over 60 commands/second and is recommended for high performance applications such as tracking.

Ordering:

PTU-CPI "C Language Programmer's Interface..."

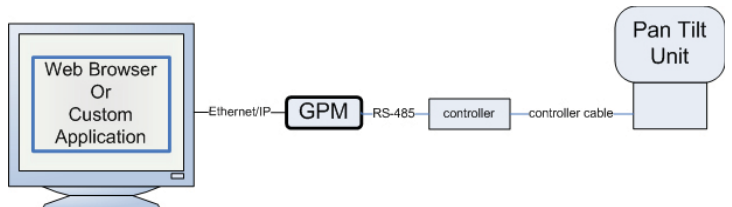


Ethernet/Web Interface and Geo-Pointing

The pan-tilt can be controlled via commands sent over Ethernet/IP using the Geo-Pointing Module (GPM). A simple HTTP based command string format is documented in the Geo-Pointing Module User's Manual. The GPM also includes a graphical web interface that allows pan-tilt control and configuration from a mouse and entered commands. The GPM supports command rates of up to 2 commands/second. The GPM also supports control of the pan-tilt by sending latitude, longitude, altitude commands over Ethernet. Operations of geo-pointing is described in the GPM User's Manual.

Ordering:

PTU-DGPM "Geo-Pointing Module..."

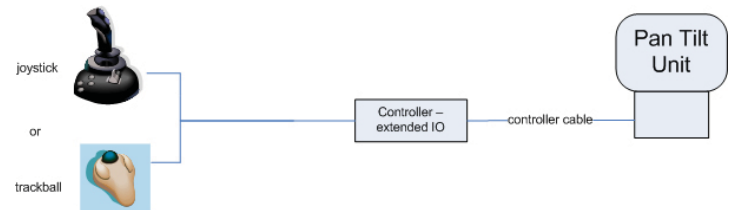


Joystick or Trackball

With the extended I/O option, two additional RS-232 ports are added to control other serial devices from the PTU controller host port. This supports direct serial joystick or trackball control of pan-tilt.

Ordering:

PTU-D46-_-S-E "Extended I/O (EIO) Option ..."
 PT-EIO-JOY-DB "Joystick for use with EIO option..." OR
 PT-EIO-TRACKBL "Serial trackball for use with EIO option..."

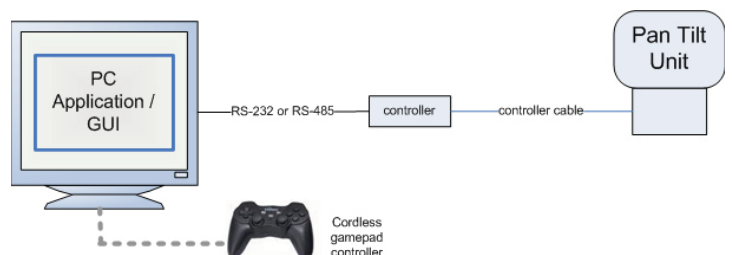


PC Control Interface (and gamepad option)

A PC-based software application (PT-AS-01) is available that accepts input from an attached gamepad controller (PT-PSC) and controls the pan-tilt via the PC's serial port.

Ordering:

PT-AS-01 "PC Software Application..."
 PT-PSC "Gamepad Controller, Cordless 2.4 GHz..."



7 Accessories

The D46 is available with several optional accessories to simplify prototyping and fielding of systems. These accessories are described below.

Power Supply

AC/DC international power supply 100-240VAC, 47-63Hz, 30VDC, 24W, IEC receptacle.
(NOTE: Input voltages under 30V can reduce the maximum speed of the unit, by an amount that is proportional to the voltage difference.)

Ordering:

PT-PS-INT30V "AC/DC International power supply..."



Side bracket

Mounting bracket, side. If this accessory is not ordered, the D46 comes with standard top bracket.

Ordering:

D46AC-BKT-Zstd

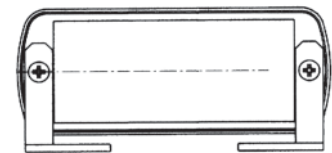


Controller mounting bracket

Mounting bracket kit for PTU-D46 controller

Ordering:

ENC-PTCB-bracket



Joystick

Serial joystick for use with EIO option. MS mouse compatible.

Ordering:

PTU-Dxx-S-E "Extended I/O (EIO) Option ..."
PT-EIO-JOY-DB "Joystick for use with EIO option..."

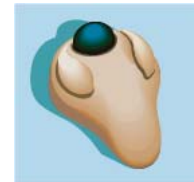


Trackball

Serial trackball for use with EIO option.

Ordering:

PTU-Dxx-S-E "Extended I/O (EIO) Option ..."
PT-EIO-TRACKBL "Serial trackball for use with EIO option..."



Geo-Pointing Module and Ethernet/Web Interface

The Geo-Pointing Module provides ethernet/web interface to control the pan-tilt, as well as geo-pointing capabilities. See the Geo-Pointing Module datasheet and User's Manual for details.

Ordering:

PT-DGPM "Geo-Pointing Module..."

