

7 NETWORKING

The PTU controller lets you connect up to 127 PTUs to a single host computer port. Your host computer can then address each PTU on the network as though the PTU were the only controller attached to the host. In this way, it is simple to migrate existing code developed for a single PTU to a network of PTUs controlled by a single host computer.

This section describes the basic installation and setup steps required to network your pan-tilt units.

7.1 Basic Networking Setup Steps

The steps in networking your PTU controllers to your host computer are:

1. Sketch out the physical placement of your PTU controllers and host computer.
2. Assign a unique network ID number to each PTU controller.
3. Connect the PTU controllers and host computer to the PTU network.
4. Test the configuration by addressing each PTU controller by its unit ID and commanding and querying its attached pan-tilt unit.

7.2 PTU Network Connections

Figure 6 illustrates how PTU controllers can be networked and connected to a host computer via its RS-232 port. Each PTU controller has a built-in RS-232 to RS-485 converter, and the host computer can be connected to the RS-485 controller network by simply connecting to the RS-232 connector on a PTU controller box. The PTU controllers are then connected together via an RS-485 multi-drop network (full duplex).

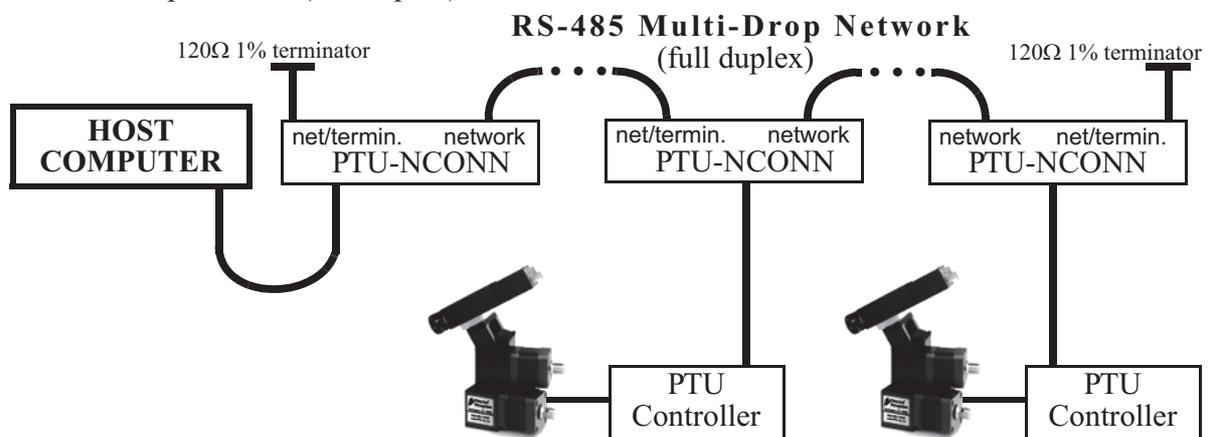


Figure 6: Making PTU Network Connections

The basic start configuration for networking PTU-controllers may be made using the PTU Network Starter Kit (model PTU-D46-NET-SK). This starter kit includes two Y-connectors used to connect to each of two PTU controllers, a data connection cable, and two network terminators. Additional PTU controllers may be networked using the PTU Network Addition Unit Kit (model PTU-D46-NET-AU), and this includes an additional Y-connector and data connector cable.

Figure 7 shows the wiring from the PTU RS-485 controller network receptacle (RJ-12, 6P6C). Several issues are important to note when you make your own data cables. First, use a

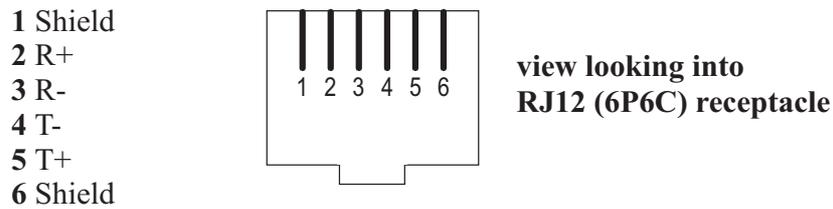


Figure 7: RS-485 Wiring

good quality cable. Though a good quality telephone cord cable can be used, use of a twisted pair cable is highly recommended. A twisted pair whose impedance is about 100Ω is typically used for longer RS-485 runs. The twisted pair provides good noise immunity owing to the relative signals used by the RS-485 standard.

For some applications, the host computer may directly provide RS-485 full-duplex I/O. In this case, you may use the RS-485 wiring diagram shown in Figure 7 to directly connect your host computer to the PTU controller network. For computers with only RS-232, RS-485 connections may be simply made using an external RS-232 to RS-485 converter. Directed Perception has tested/qualified two converters: ATEN IC-485S and Moxa A50 which both require a flipped RJ-12 connector (such as a standard phone cord). It is important to note that the network should be terminated using 120Ω 1% resistors to protect against signal ringing on the network. Termination is achieved by placing the resistors between the RS-485 Transmit+/Transmit- and Receive+/Receive- wires at each end of the multidrop wiring network.

7.3 PTU Network Software Commands

This section describes the pan-tilt command set used to configure, set and query the network configuration of your PTU controllers.

7.3.1 Unit Network ID

Description

Specify or query the PTU controller network unit ID number. By default, the PTU unit ID is set to zero which indicates the PTU controller is not networked, and the PTU controller is in the default interactive communications mode. When assigning a unit ID number to a controller, the unit ID number should be unique, the controller should be the only PTU controller attached to the host computer or terminal (otherwise other controllers may be set to the same unit ID number). A unit ID of zero may be used to put a PTU controller back in interactive (non-networked) mode.

Syntax

Query current PTU network unit ID:	U<delim>
Set PTU to interactive mode (non-networked):	U0<delim>
Set PTU network unit ID:	U<unit_ID><delim>
where $1 \leq \text{<unit_ID>} \leq 127$	

Example

The following queries a PTU unit ID, then sets and stores the unit ID configuration so that upon power-up the new unit ID will be used.

```

U * Unit ID is 0
U1 *
U * Unit ID is 1
U1 *
DS *

```

Related Topics

- Unit Select/Deselect: See Section 7.3.2.

7.3.2 Unit Select/Deselect**Description**

Command is used to select the PTU to be controlled. A PTU controller will execute incoming host computer commands only when the preceding unit_ID selected by the host is (a) equal to the PTU controller's assign unit ID, or, (b) equal to 0. A host computer can broadcast instructions to be executed by all PTO controllers using unit_ID=0. Only one PTU controller can provide feedback to the host computer at a time. A PTU controller provides feedback to the host computer only when the host computer has selected its unit ID. A PTU controller buffers its outgoing data until the host computer polls it -- the current PTU controller buffer size is about 100 bytes.

Syntax

Select a PTU controller for bi-directional data: **<unit ID><delim>**
 Broadcast to all networked PTU controllers: **0<delim>**
 where $0 \leq \text{<unit_ID>} \leq 127$

Example

```

1
pp300 *
0
pp300
1
*

```

Related Topics

- Unit Network ID: See Section 7.3.1