

PolyScience: Detail on communicating to an "AD" instrument via Ethernet UDP on the rear panel of the instrument

Setup information shown here describes a simple, direct (one to one) connection from a PC's LAN ethernet port straight to an "AD" instrument ethernet port, using a standard Cat5 cable

- "PacketSender"

Allows commands to be sent to the "AD" via Ethernet UDP, this application downloaded from internet, free to use.
- "WireShark"

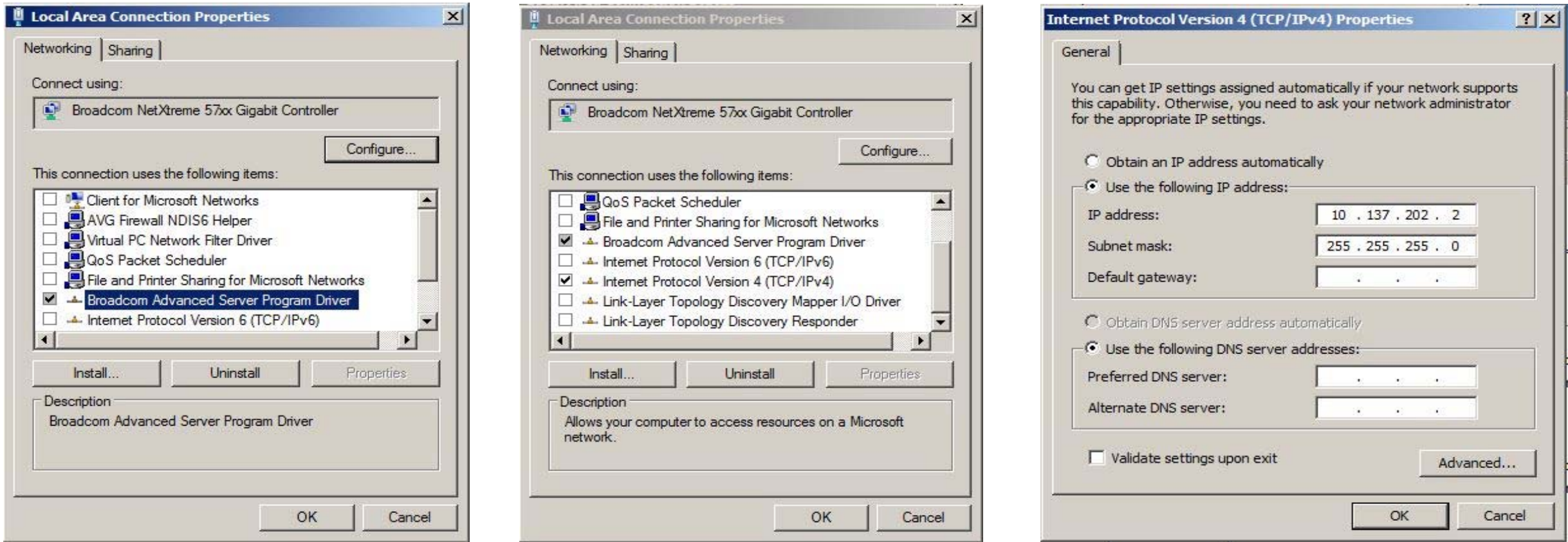
Monitors and Displays Ethernet messages sent and received by "PacketSender" or "ADUDP" to the "AD" instrument, this application downloaded from internet, free to use.
- "ADUDP"

Simple standalone Windows application which sends a command to, and display responses from, the "AD" instrument over Ethernet UDP, available upon request from PolyScience

"AD" instrument menu settings required ... >
(see "AD" product manual for more detailed explanations)

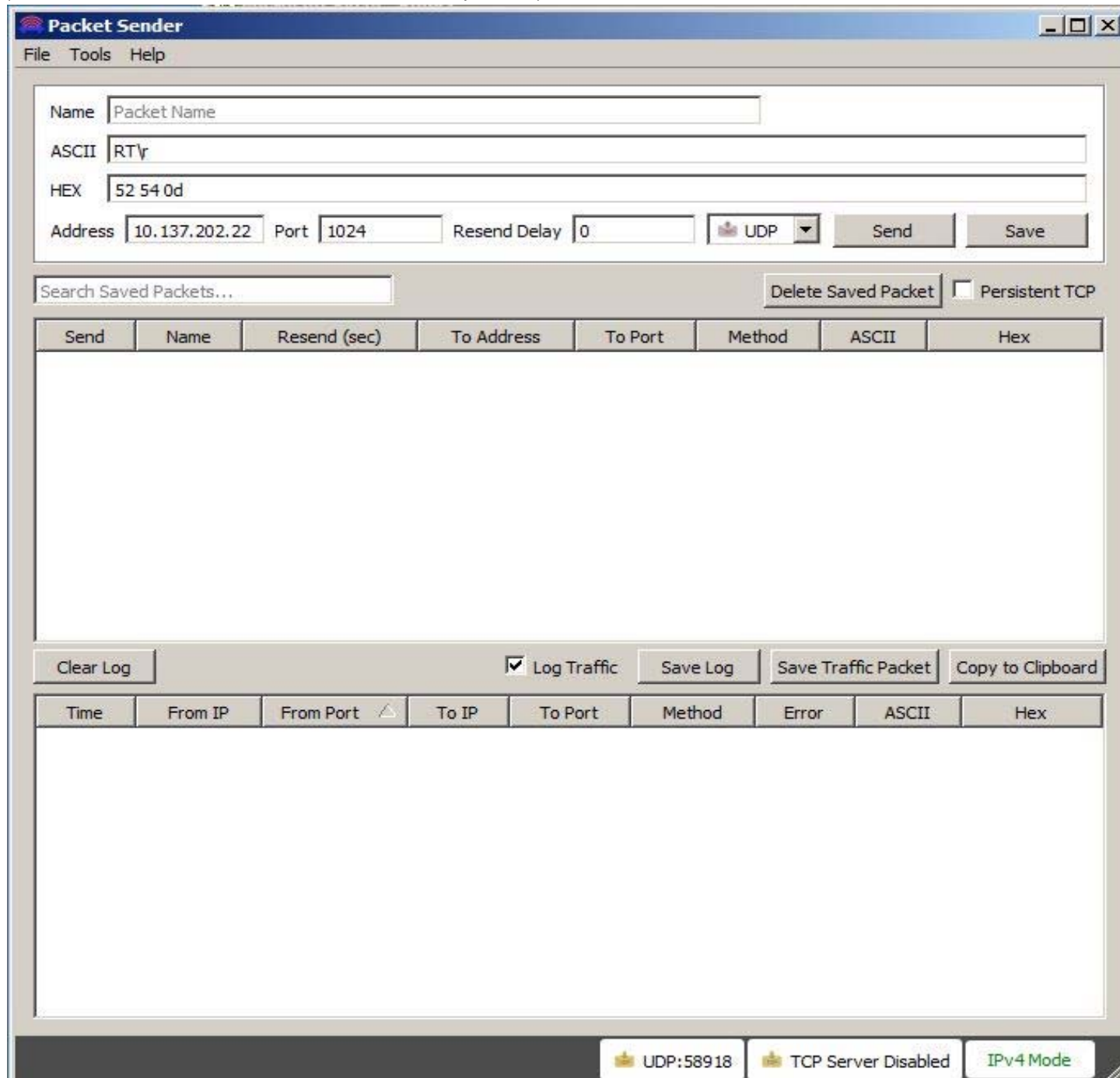
	COM ETHERNET
	UNLOCK 100
	ETH FIXED IP
IP	010.137.202.022
nEt	255.255.255.000
rouTE	010.137.202.001

Notebook / desktop Windows 7 PC, Local Area Network Settings for communicating to an "AD" instrument via Ethernet UDP protocol



"PacketSender" Setup to Read Temperature from the "AD" instrument...

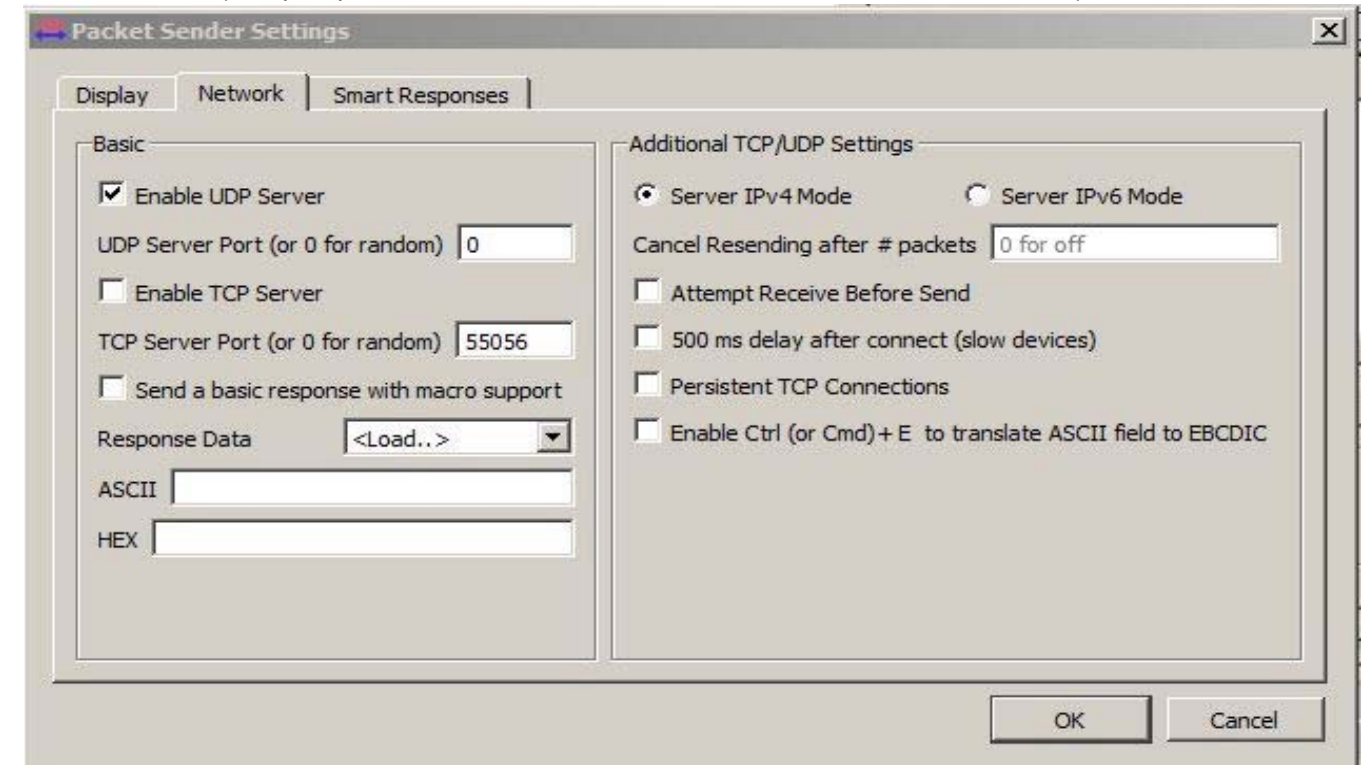
(set IP.ADDR = 10.137.202.22, Port = 1024, UDP protocol)



The Packet Sender application window is shown. It has a menu bar with File, Tools, and Help. The main area contains fields for Name (Packet Name), ASCII (RT), and HEX (52 54 0d). Below these are fields for Address (10.137.202.22), Port (1024), Resend Delay (0), and a dropdown menu set to UDP. There are Send and Save buttons. Below the main fields is a search bar for saved packets, a delete button, and a checkbox for Persistent TCP. A table with columns Send, Name, Resend (sec), To Address, To Port, Method, ASCII, and Hex is present. At the bottom, there are buttons for Clear Log, Log Traffic (checked), Save Log, Save Traffic Packet, and Copy to Clipboard. A status bar at the very bottom shows UDP:58918, TCP Server Disabled, and IPv4 Mode.

Send	Name	Resend (sec)	To Address	To Port	Method	ASCII	Hex
------	------	--------------	------------	---------	--------	-------	-----

"PacketSender" (Setup required, "Enable UDP Server with UDP Server Port 0 for random")



The Packet Sender Settings dialog box is shown. It has tabs for Display, Network, and Smart Responses. The Basic tab is selected. It contains checkboxes for Enable UDP Server (checked), Enable TCP Server (unchecked), and Send a basic response with macro support (unchecked). There are input fields for UDP Server Port (0) and TCP Server Port (55056). A dropdown menu for Response Data is set to <Load...>. There are also input fields for ASCII and HEX. The Additional TCP/UDP Settings section has radio buttons for Server IPv4 Mode (selected) and Server IPv6 Mode (unselected). There is a field for Cancel Resending after # packets (0 for off). Other options include Attempt Receive Before Send, 500 ms delay after connect (slow devices), Persistent TCP Connections, and Enable Ctrl (or Cmd) + E to translate ASCII field to EBCDIC. OK and Cancel buttons are at the bottom.

"PacketSender", Ethernet UDP Send Command "RT\r" sent to 10.137.202.22

Packet Sender

FileToolsHelp

NamePacket Name

ASCIIRT\r

HEX52 54 0d

Address10.137.202.22Port1024Resend Delay0UDP

SendSave

Search Saved Packets...

Delete Saved Packet

Persistent TCP

SendNameResend (sec)To AddressTo PortMethodASCIIHex

Clear Log

Log Traffic

Save Log

Save Traffic Packet

Copy to Clipboard

TimeFrom IPFrom PortTo IPTo PortMethodError

110:51:37.851 amYou5891810.137.202.221024UDPRT\r

UDP:58918

TCP Server Disabled

IPv4 Mode

Filename (AD-UDP-information 20170503.xls)
Sheet (Sheet1)
Page (3 of 8)

"Wireshark", Ethernet UDP traffic monitor, highlights the UDP Send Command "RT\r" (note the expression of "ip.addr == 10.137.202.22" only displays messages specific to this IP address)

***Broadcom NetXtreme Gigabit Ethernet Driver: Local Area Connection**

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

ip.addr == 10.137.202.22 Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.137.202.2	10.137.202.22	UDP	45	58918 → 1024 Len=3
2	0.023021	10.137.202.22	10.137.202.2	UDP	60	1024 → 1026 Len=7

Frame 1: 45 bytes on wire (360 bits), 45 bytes captured (360 bits) on interface 0
Ethernet II, Src: Dell_69:3b:45 (f0:4d:a2:69:3b:45), Dst: Creative_79 (00:50:c2:c8:90:79)
Internet Protocol Version 4, Src: 10.137.202.2, Dst: 10.137.202.22
User Datagram Protocol, Src Port: 58918, Dst Port: 1024
Data (3 bytes)

```
0000  00 50 c2 c8 90 79 f0 4d a2 69 3b 45 08 00 45 00  .P...y.M .i;E..E.
0010  00 1f 16 d7 00 00 80 11 00 00 0a 89 ca 02 0a 89  .....
0020  ca 16 e6 26 04 00 00 0b a9 47 52 54 0d  ...&.... .GRT.
```

Data (data), 3 bytes | Packets: 2 · Displayed: 2 (100.0%) | Profile: Default

"WireShark", Ethernet UDP traffic monitor, highlights the UDP Received Message reported by the "AD" instrument...

*Broadcom NetXtreme Gigabit Ethernet Driver: Local Area Connection

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

ip.addr == 10.137.202.22

Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.137.202.2	10.137.202.22	UDP	45	58918 → 1024 Len=3
2	0.023021	10.137.202.22	10.137.202.2	UDP	60	1024 → 1026 Len=7

+

Frame 2: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0

+

Ethernet II, Src: Creative_79 (00:50:c2:c8:90:79), Dst: Dell_69:3b:45 (f0:4d:a2:69:3b:45)

+

Internet Protocol Version 4, Src: 10.137.202.22, Dst: 10.137.202.2

+

User Datagram Protocol, Src Port: 1024, Dst Port: 1026

+

Data (7 bytes)

0000

f0 4d a2 69 3b 45 00 50 c2 c8 90 79 08 00 45 00

.M.i;E.P ...y..E.

0010

00 23 00 25 00 00 64 11 ad 7a 0a 89 ca 16 0a 89

.#.%..d. .z.....

0020

ca 02 04 00 04 02 00 0f 00 00 20 32 30 2e 30 30

..... ..20.00

0030

0d 00 00 00 00 00 00 00 00 00 00 00

.....

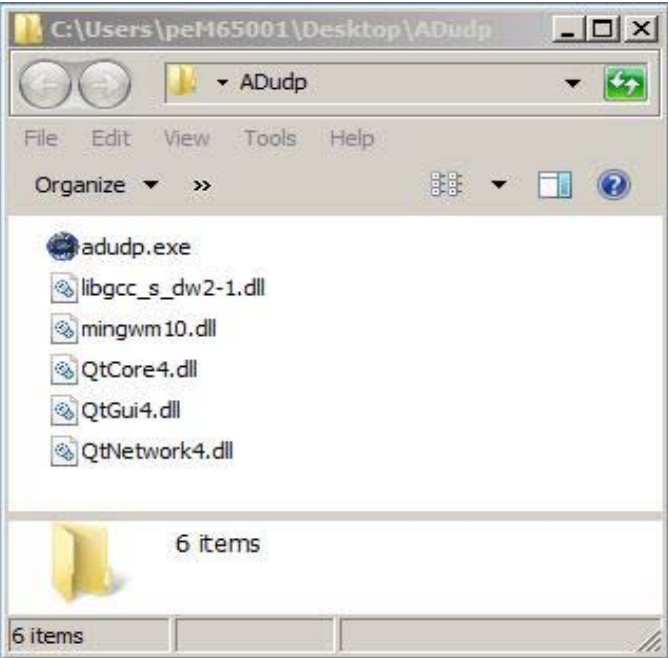
Data (data), 7 bytes

Packets: 2 · Displayed: 2 (100.0%)

Profile: Default

"ADUDP", application to send a command, to receive the response, from an "AD" instrument over Ethernet UDP

A. application folder contents



B.



C. enter IP Address of "AD" instrument



D. enter a command to send, followed by the "Enter" key



E. response from the "AD" to the "RT" command (Read Temperature)



F. response to the command if the Ethernet is not operating correctly

ADUDP

Set IP

10.137.202.22

Enter Command

RT

Response

NET_ERR

G. command unrecognized, command is case sensitive, must use all Upper Case characters

ADUDP

Set IP

10.137.202.22

Enter Command

rs

Response

?

H. correct command entered, when Ethernet is operating correctly

ADUDP

Set IP

10.137.202.22

Enter Command

RS

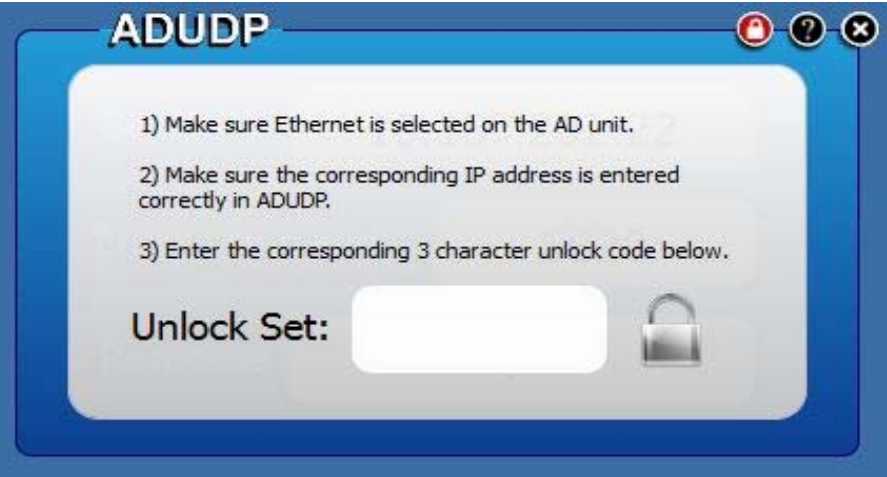
Response

20.00

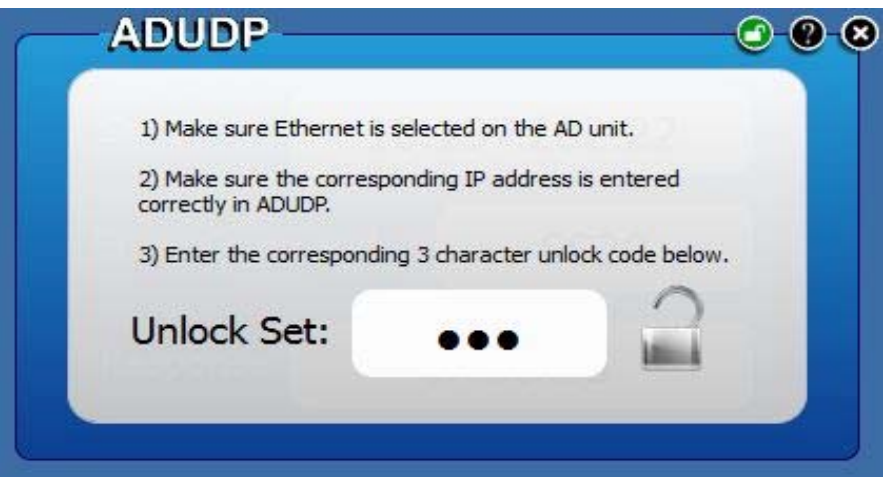
To allow a "Set" command, such as "SS20.02", Set Point = "20.02°C", to be accepted by the "AD" instrument, the "UNLOCK" menu needs setting on the "AD" and within the "ADUDP" application

on the "AD" instrument front panel...
move to menu selection displayed as "SET LOCKED"
at the "AD" front panel, enter "UNLOCK 100" at the "SET LOCKED" menu by sliding up/down on the "SET" display area
this number "100" is then entered into the "ADUDP" application by selecting the "Red Padlock" icon as shown below

A. select the Red Padlock icon



B. enter "100"



C.



D. correct operation. The "100" entries at the "AD" and the "ADUDP" match



E. incorrect operation, the command is not accepted by the "AD", mismatch in the "100" entries at the "AD" and the "ADUDP"

