



**SightLine**  
APPLICATIONS

## **EAN-Network Configuration**

PN: EAN-Network-Configuration

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 **IMPORTANT:** Identifies crucial information that is important to setup and configuration procedures.

 *Used to emphasize points or reminds the user of something. Supplementary information that aids in the use or understanding of the equipment or subject that is not critical to system use.*



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## 1 Overview

Document describes configuring a static IP address for the 1500-OEM and 3000-OEM video processing board. It additionally covers setting telemetry destination and port. This documentation also pertains to SLE versions. General knowledge of IP addressing is recommended.

### 1.1 Associated Documents

[EAN-Startup Guide 1500-OEM](#): Describes steps for connecting, configuring, and testing the 1500-OEM video processing board on the 1500-AB accessory board.

[EAN-Startup Guide 3000-OEM](#): Describes steps for connecting, configuring, and testing the 3000-OEM video processing board on the 3000-IO interface board.

[Interface Command and Control \(IDD\)](#): Describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a local download on the [Software Download](#) page.

Panel Plus User Guide: Provides descriptions of all the settings in the Panel Plus application. (Located in the Panel Plus application in the *Help* menu.)

### 1.2 SightLine Software Requirements

Windows 7, 8, or 10 required for use with the Panel Plus application.

The 3000-OEM (REV C) requires firmware 2.24.xx and higher.

**ⓘ IMPORTANT:** The Panel Plus software version should match the firmware version running on the board.

## 2 Default IP Addressing

Dynamic Host Configuration Protocol (DHCP) is supported by all SightLine boards. This support allows SLA boards to automatically obtain an Internet Protocol (IP) address. This assignment includes the subnet mask and default gateway. In the event that a DHCP server is not available on the connected network, each SLA board will then default to a predefined IP address.

**1500-OEM Predefined IP Address:** 169.254.1.180, 255.255.0.0 subnet mask, and no gateway is defined.

**3000-OEM Predefined IP Address:** 169.254.1.181, 255.255.0.0 subnet mask, and no gateway is defined.

This predefined assignment supports the implemented address block of 169.254.0.0/16. If a Windows PC starts without a static or DHCP assigned IP address, it will then default within this same address block (and subnet).

*These addresses are only valid on the link, i.e., as a local network segment or point-to-point connection that a host PC is connected to. These addresses are not routable and cannot be the source or destination of packets crossing the internet.*



### 3 Discovering SLA Boards on the Network

When opening the Panel Plus software, it will send out an *SLDiscover* packet on the connected network to look for any SLA boards. An example is shown in [Figure 1](#). If there are other boards on the same physical network, they will also be displayed and added to the *SightLine Boards* dropdown menu on the *Connect* tab in Panel Plus.

It is important to know the address of the system that you want to connect with, and to ensure the host PC is on the same network/subnet.

If a response is not shown with a board name and IP address, see [Connection Issues](#) for more information.

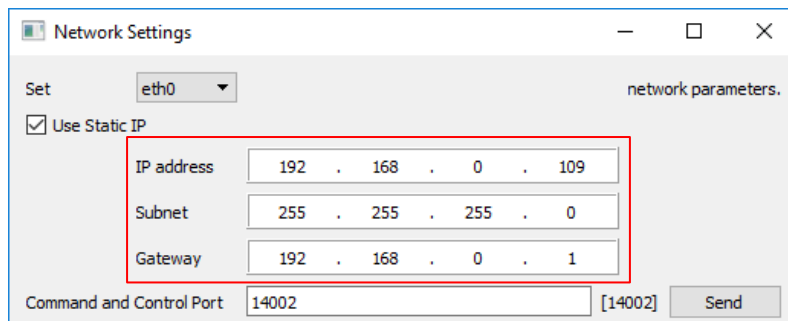
```
sent: SLDiscover
received: SLA3000_ea4870, 192.168.0.27
received: SLA3000_3a2b7a, 192.168.0.24
```

Figure 1: SLDiscover Command Sequence

### 4 Defining Static IP Address

The following steps reference the Panel Plus software.

1. Connect to the board using the Panel Plus application. See the [1500-OEM Startup Guide](#) or the [EAN-Startup Guide 3000-OEM](#) for connection instructions.
2. Once connected to the board, from the main menu go to *Configure » Network Settings*.
3. Select the checkbox for *Use Static IP*. Enter the IP Address, Subnet, and Gateway address.
4. Click the *Send* to update the parameter file.



5. From the main menu, go to *Parameters » Save to board*.
6. From the main menu, go to *Reset » Board* or power cycle the board.

*After reboot, reconnect to the board with Panel Plus. Select the Compression tab. Start (or stop) streaming by clicking the Start Streaming (or Stop Streaming) button.*

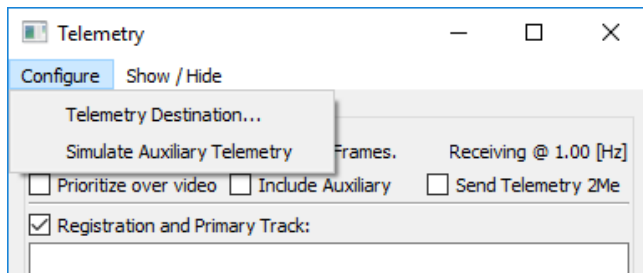
7. After rebooting the board will now have the newly assigned IP address. Make sure to change the IP address on the host PC to an address on the same logical subnet.



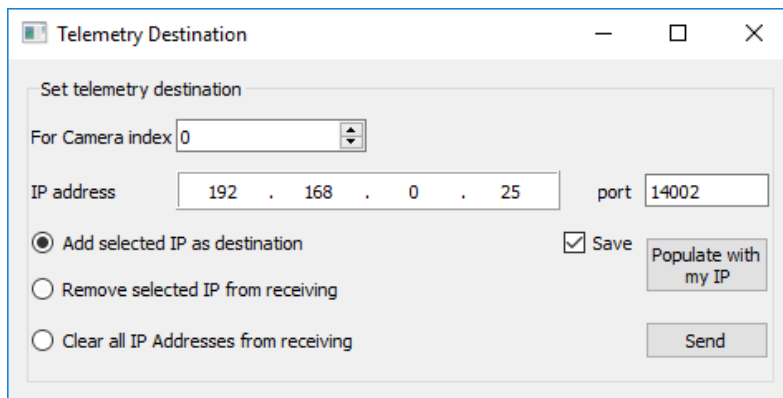
## 5 Telemetry Destination IP Addresses

The destination IP address for telemetry will typically be the IP address (as input) of the gimbal control system or the autopilot program.

1. From the main menu in Panel Plus go to *Configure » Telemetry*.
2. From the Telemetry dialog window menu go to *Configure » Telemetry Destination*.



3. In the Telemetry Destination dialog window, select the camera index number. This will be the source camera for the pixel telemetry.
4. Set the destination IP address and port. This will be UDP packet and the port will be a listening UDP port on the remote system.
5. Select the *Add selected IP as destination*, and then click *Send*. This sends this configuration data to the SLA board. Up to five telemetry destinations may be added.



To enter additional telemetry destination after the maximum (5) has been reached, a destination IP address will need to be removed. Use the *Remove selected IP from receiving* and then click *Send*.

To clear all the telemetry destination IP addresses, select *Clear all IP Addresses from receiving* and then click *Send*.

6. From the main menu, go to *Parameters » Save to board*.
7. From the main menu, go to *Reset » Board* or power cycle the board.
8. After reboot, reconnect to the board with Panel Plus. Select the Compression tab. Start (or stop) streaming by clicking the Start Streaming (or Stop Streaming) button.



## 6 Changing Network Interface Metric for Panel Plus

To use a wireless adapter for general internet and network access and use a local LAN (hard wired interface) connection to an SLA board, the network interface metric should be changed. This allows Panel Plus application to communicate on a local LAN adapter.

To change the network interface metric:

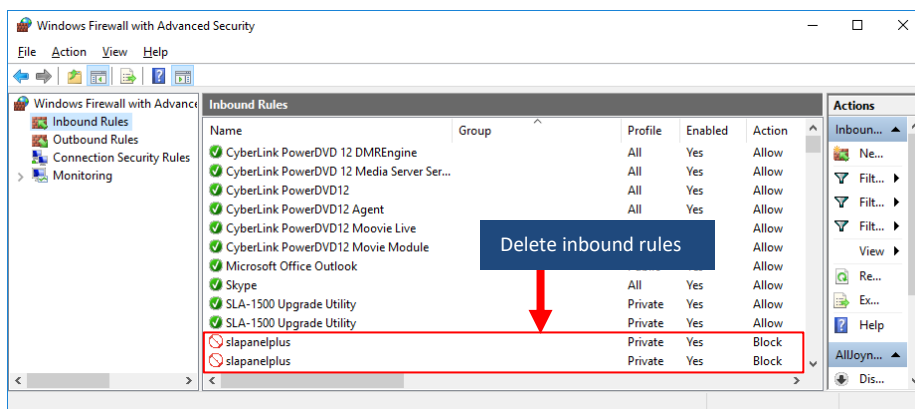
1. Go to the Network Sharing Center in Windows.
2. Select *Change Adapter Settings*.
3. Right click on the local area network adapter. Click on *TCP/IPv4 settings*, select properties.
4. Click on *Advanced* tab.
5. Disable the *Automatic metric* check box.
6. Set the interface metric to 1. A low number means to use this adapter.
7. Select *Wireless Adapter* and repeat the process. Set the interface metric higher than 999.
8. Disable and re-enable the adapters (or reboot PC) for the settings to take effect.

## 7 Connection Issues

### 7.1 Windows Firewall

Failure to allow access in the Windows Security Alert prompt upon initial startup of the Panel Plus application can cause connection issues.

1. Close the Panel Plus software application and open the Windows Firewall Security Manager on the host PC.
2. Go to *Inbound Rules* and delete the two *slapanelplus* rules (TCP and UDP).
3. Re-start the Panel Plus application and allow access in the Windows Security Alert prompt window.







## 7.2 Serial Connection

A PC-to-board serial connection can be used for troubleshooting or if a network connection cannot be established.

Most network connection issues are related to either cabling or assigned IP addresses not matching properly. The Panel Plus software will automatically recognize serial ports and list them in the dropdown menu for available connections.

See the Serial Communications section in the [EAN-Startup Guide 1500-OEM](#) or the [EAN-Startup Guide 3000-OEM](#) for setting up a serial connection in Panel Plus.

**ⓘ IMPORTANT:** If connecting to the serial port on the 1500-OEM or 3000-OEM boards from a host PC, the connection may require a null modem serial cable or adapter for proper communications. The pinout for this cable can be found in the [ICD-1500-OEM](#) or [ICD-3000-OEM](#).

If you are still having issues and require additional support, please contact [Technical Support](#).

## 8 Advanced Networking Tip and Techniques

SightLine OEM products run a version of embedded Linux on the ARM processor. Many network related services and network capabilities can be accessed. Additional functionality (such as Ethernet to serial passthrough) can be accomplished with the Panel Plus software interface.

### 8.1 Terminology

SLA-hardware	General purpose term to describe any hardware product sold by SightLine
Target	Refers to the Linux Kernel running on SLA-hardware
Host	Refers to the host PC used to interface with SLA-hardware
DM-37x#	Linux command prompt on target
\$	Linux command prompt on host

### 8.2 Tool Summary

Table 1: Tool Summary

Utility	Description
SSH (Secure Shell)	Allows users to logon to target and execute commands
FTP	Allows users to move files from host to target
SCP (Secure Copy)	Used to transfer files from host to target
TC (Traffic Control)	Used to modify the flow of Ethernet packets
VCONFIG	Create and remove virtual Ethernet devices (VLAN)
NETSTAT	Used to display networking information such as open ports
ROUTE	Used to create route tables
IFCONFIG	Used to configure network interfaces
ETHTOOL	Used to modify Ethernet interface parameters



### 8.3 Third Party Utilities

Use of third party support tools and utilities are integral to the integration and support of SLA-products. SightLine Applications offers the links shown below as a convenience. Users that download third part tools do so at their own risk and are bound to the usage agreements contained for each product.

There are many tools and utilities that are available on the web that provide identical functionality. Developers should use the tools that works best for their application.

<a href="#">FTP - FileZilla</a>	FTP client utility
<a href="#">Tera Term</a> or <a href="#">PuTTY</a>	Terminal emulator (command console)
<a href="#">Wireshark</a>	Network protocol analyzer

### 8.4 User Names and Passwords

SightLine uses the following conventions for usernames and passwords shown in Table 2.

Table 2: Username and Passwords

System	User name	Password
Target Hardware	<i>root</i>	<i>root</i>
Host (PC)	<i>slroot</i>	<i>slroot</i>

### 8.5 Changing the Default Password on the Target

**ⓘ IMPORTANT:** Use discretion when performing this operation. Some SightLine documentation and software such as Panel Plus assumes *root* is used as the default username and password. Changing this default behavior may render some operations unavailable.

1. Use PuTTY (or similar) to establish an SSH session to the target.

2. Login using the default username and password: *root*
3. At the command prompt, type `passwd`. Enter a new password and follow the prompts. Use characters and numbers to create a strong password.

```

192.168.1.183 - PuTTY
Using username "root".
root@192.168.1.183's password:
DM-37x# passwd
Changing password for root
New password:
Retype password:
Password for root changed by root
DM-37x# █

```




## 8.6 Assigning Multiple IP Addresses to Single NIC

It is possible to route specific traffic to different networks. This process is referred to as multihome. In this example, the target has the existing IP address of *192.168.1.183*. The other network segment has an IP address of *192.168.0.42*.

1. Use PuTTY to establish an SSH session to the target.
2. To view the current settings, type: `ifconfig`
3. To add another IP, type: `ifconfig eth0:1 192.168.0.42 netmask 255.255.255.0 multicast up`

Both IP addresses (192.168.1.183 and 192.168.0.42) are now accessible on the LAN.

 *eth0:1 can be changed as appropriate to match your system. For example, eth0:1 is already in use on the 3000-OEM, therefore eth0:2 or similar can be used.*

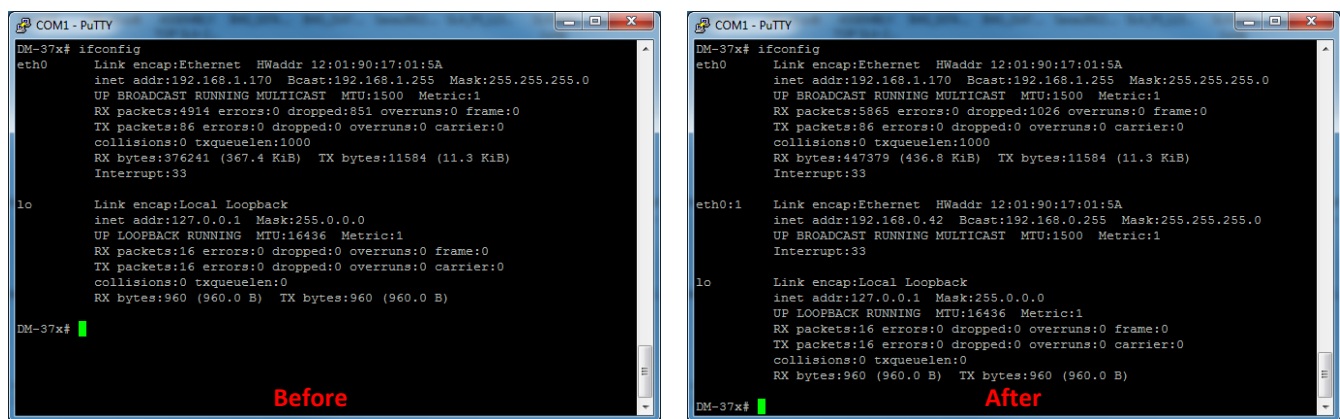


Figure 2: Routing Specific Traffic to Different Networks

## 8.7 Configuring a VLAN

Use PuTTY to establish an SSH session to the target.

### Adding a VLAN:

Type in:	Reason:
1. <code>vconfig add eth0 5</code>	Add VLAN ID 5
2. <code>ifconfig eth0.5</code>	To see the VLAN
3. <code>ifconfig eth0.5 192.168.42.100 netmask 255.255.255.0 broadcast 192.168.42.255 up</code>	To add an IP address for the VLAN
4. <code>cat /proc/net/vlan/eth0.5</code>	To check the status

 *This can be added to the /etc/rc.d/rc.local or /etc/network/interfaces.*

### Removing a VLAN:

- Type in:
1. `ifconfig eth0.5 down`
  2. `vconfig rem eth0.5`



## 8.8 Traffic Control (tc)

Traffic control (tc) can be used to normalize the rate at which packets are transmitted preventing massive peaks when using IP radios or similar.

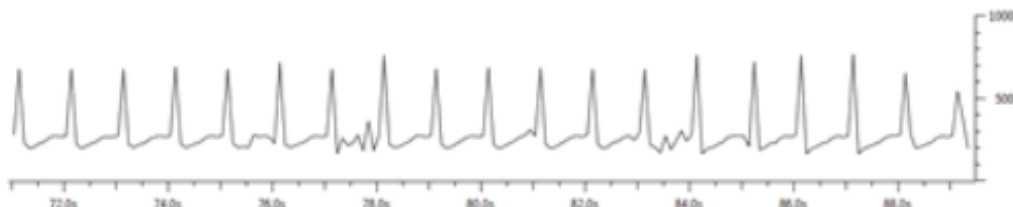
In this example, the target will be configured to transmit video, and then the packet formation will be adjusted.

The following steps reference the Panel Plus software.

1. Connect to target using Panel Plus.
2. Set up for Network Output.
3. Configure MPEG2-TS + H.264 video streaming.
4. Click *Send*. The target should now be streaming video.
5. Start Wireshark.
6. From the main menu go to *Capture » Interfaces*.
7. Filter the H.264 packets that are going to port 15004.

No.	Time	Source	Destination	Protocol	Length	Info
4311	0.00011300	192.168.1.131	192.168.1.102	MPEG TS	1358	Source port: 4924
4312	0.00010700	192.168.1.131	192.168.1.102	MPEG TS	1358	Source port: 4924
4313	0.00011300	192.168.1.131	192.168.1.102	MPEG TS	1358	Source port: 4924
4314	0.00011200	192.168.1.131	192.168.1.102	MPEG TS	1358	Source port: 4924
4315	0.00015900	192.168.1.131	192.168.1.102	MPEG TS	1358	Source port: 4924
4316	0.00000200	192.168.1.131	PTS 2283.539822222	MPEG PES	418	
4317	0.03292900	DTS 2283.539822222	PTS 2283.539822222	MPEG TS	1358	video-stream

8. Configure the scale to view the base line data and periodic large data peaks.
  - a) *Menu » Statistics » IO Graph*
  - b) *X Axis » Tick Interval = 0.1 sec*
  - c) *Y Axis » Unit: Bytes/Tick*



9. Use PuTTY to establish an SSH session to the target.

```

597 ?      00:03:44 VideoTrack1500
599 ?      00:00:00 DSPLINK_DPC_0
601 ?      00:00:02 DSPLINK_DPC_1
615 ?      00:00:01 DSPLINK_DPC_2
633 ?      00:00:00 dhclient
651 ?      00:00:00 kworker/0:0
653 ?      00:00:00 dropbear
654 pts/0  00:00:00 sh
666 pts/0  00:00:00 ps
DM-37x# kill 597

```



10. To list running processes, type: `ps -A`

11. To stop the VideoTrack1500 process, type: `kill 597`

12. To configure and run the traffic control (tc) binary, type:

```
tc qdisc replace dev eth0 handle 1:0 root tbf burst 3000 limit 300k rate
2000000 peakrate 2500000 mtu 3000
```

13. Edit parameters as necessary.

14. To restart the application, type: `./VideoTrack1500`

 In WireShark there should be less peaks and more consistent output packet rate.

## 8.9 FTP

There are many FTP client applications available for this process. In this example the Windows command line is used. The default user name and password are *root*.

When connecting to the board, the SLA-hardware will access the `/mnt/mmcbkOp1` directory. This is the directory of the MicroSD card (if installed).

Use the following commands to manage the files:

**List files:** `ls`

```
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
slaimage0.jpg
slaimage_0000.jpg
slaimage_0001.jpg
slavideo_0000.ts
226 Directory send OK.
ftp: 71 bytes received in 0.00Seconds 71000.00Kbytes/sec.
```

**Get a file:** `get sla_image_0001.jpg`

```
ftp> get slaimage_0001.jpg
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for slaimage_0001.jpg (34788 bytes).
226 File send OK.
ftp: 34788 bytes received in 0.00Seconds 34788000.00Kbytes/sec.
ftp>
```

**Change directory:** `cd /root`

```
ftp> cd /root
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
1400e013015a86d1.license
VideoTrack1500
captureSample
cmenk.ko
dsplink.ko
```



**Get param file:** get param51ac9a4a.txt

```
ftp> get param51ac9a4a.txt
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for param51ac9a4a.txt (11088 bytes).
226 File send OK.
ftp: 11088 bytes received in 0.00Seconds 11088000.00Kbytes/sec.
ftp>
```

**Remove param file:** del param51aca4a.txt

```
ftp> del param51ac9a4a.txt
250 Delete operation successful.
ftp>
```

**Upload a new param file:** put param51ac9a4a.txt

```
ftp> put param51ac9a4a.txt
200 PORT command successful. Consider using PASV.
150 Ok to send data.
226 File receive OK.
ftp: 11088 bytes sent in 0.00Seconds 5544.00Kbytes/sec.
ftp>
```

## 8.10 Changing the MTU

Based on radio capability or other network issues it may be necessary to reduce the Maximum Transmission Unit (MTU) or packet size. The default MTU is 1500 as shown in Tera Term.

```
192.168.1.70 - Tera Term VT
File Edit Setup Control Window Help
root@sla3000:~#
root@sla3000:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 74:DA:EA:43:CC:9E
          inet addr:192.168.1.70  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING PROMISC ALLMULTI MULTICAST  MTU:1500  Metric:1
          RX packets:179649 errors:0 dropped:49035 overruns:0 frame:0
          TX packets:695422 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:25828640 (24.6 MiB)  TX bytes:740121834 (705.8 MiB)
          Interrupt:40
```

Figure 3: Default MTU in Tera Term

Use Wireshark to view packets. Note that most packets are 1442 bytes.

No.	Time	Source	Destination	Protocol	Length	Info
125	0.611776	192.168.1.70	192.168.1.69	RTP	1442	PT=DynamicRTP-Type-96,
126	0.611777	192.168.1.70	192.168.1.69	RTP	1442	PT=DynamicRTP-Type-96,
127	0.611980	192.168.1.70	192.168.1.69	RTP	1442	PT=DynamicRTP-Type-96,
128	0.612172	192.168.1.70	192.168.1.69	RTP	1442	PT=DynamicRTP-Type-96,
129	0.612172	192.168.1.70	192.168.1.69	RTP	1442	PT=DynamicRTP-Type-96,

Figure 4: Packet Sizes in Wireshark



In the example below, the MTU has been changed to 900 [bytes] by using the command:

```
ifconfig eth0 mtu 900
```

```

192.168.1.70 - Tera Term VT
File Edit Setup Control Window Help
root@sla3000:~# ifconfig eth0 mtu 900
root@sla3000:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 74:DA:EA:43:CC:9E
          inet addr:192.168.1.70  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING PROMISC ALLMULTI MULTICAST  MTU:900  Metri
          RX packets:184004 errors:0 dropped:50027 overruns:0 frame:0
          TX packets:911836 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:26460910 (25.2 MiB)  TX bytes:920284490 (877.6 MiB)
          Interrupt:40

```

Figure 5: MTU Reduced in Tera Term

In Wireshark note the smaller packets and fragmentation after the MTU change.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.1.70	192.168.1.69	RTP	65	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
2	0.000000	192.168.1.70	192.168.1.69	RTP	60	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
3	0.000243	192.168.1.70	192.168.1.69	IPv4	914	Fragmented IP protocol (proto=UDP 17, off=0,
4	0.000243	192.168.1.70	192.168.1.69	RTP	562	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
5	0.000243	192.168.1.70	192.168.1.69	IPv4	914	Fragmented IP protocol (proto=UDP 17, off=0,
6	0.000470	192.168.1.70	192.168.1.69	RTP	481	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
7	0.036316	192.168.1.70	192.168.1.69	RTP	65	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
8	0.036317	192.168.1.70	192.168.1.69	RTP	60	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
9	0.036542	192.168.1.70	192.168.1.69	IPv4	914	Fragmented IP protocol (proto=UDP 17, off=0,
10	0.036545	192.168.1.70	192.168.1.69	RTP	562	PT=DynamicRTP-Type-96, SSRC=0x741DB8C5, Seq=4
11	0.036547	192.168.1.70	192.168.1.69	IPv4	914	Fragmented IP protocol (proto=UDP 17, off=0,

Figure 6: Smaller Packet Sizes in Wireshark





## 8.11 Changing Interface Speed / Duplex / Auto-Negotiation Configuration

The speed, duplex, and auto-negotiation configuration of the SLA-hardware Ethernet interface can be adjusted using the *ethtool* binary on the embedded Linux system. This may be useful when integrating older devices or specialized network hardware such as satellite radios.

Open a terminal emulator and establish an SSH session to the target. Type `ethtool eth0` to check the current Ethernet interface configuration as shown in [Figure 7](#).

```

192.168.1.231 - Tera Term VT
File Edit Setup Control Window Help
root@sla3000:~# ethtool eth0
Settings for eth0:
    Supported ports: [ TP AU1 BNC MII FIBRE ]
    Supported link modes:   10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Half 1000baseT/Full
    Supports auto-negotiation: Yes
    Advertised link modes:  10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
    Advertised pause frame use: No
    Advertised auto-negotiation: Yes
    Speed: 100Mb/s
    Duplex: Full
    Port: MII
    PHYAD: 3
    Transceiver: external
    Auto-negotiation: on
    Current message level: 0x00000000 <0>

    Link detected: yes

```

Figure 7: Check Ethernet Interface Configuration

In [Figure 8](#) the interface configuration has been changed to 10 Mbps full duplex with auto-negotiation disabled by typing the command: `ethtool -s eth0 speed 10 duplex full autoneg off`

```

192.168.1.231 - Tera Term VT
File Edit Setup Control Window Help
root@sla3000:~# ethtool -s eth0 speed 10 duplex full autoneg off
root@sla3000:~# ethtool eth0
Settings for eth0:
    Supported ports: [ TP AU1 BNC MII FIBRE ]
    Supported link modes:   10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Half 1000baseT/Full
    Supports auto-negotiation: Yes
    Advertised link modes:  10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
    Advertised pause frame use: No
    Advertised auto-negotiation: No
    Speed: 10Mb/s
    Duplex: Full
    Port: MII
    PHYAD: 3
    Transceiver: external
    Auto-negotiation: off
    Current message level: 0x00000000 <0>

    Link detected: yes

```

Figure 8: Interface Speed / Duplex / Auto-Negotiation Configuration Changed





### 8.11.1 Startup - 1500-OEM Ethernet Interface Configuration

To set the interface configuration at startup, add an *ethtool* command to the *rc.local* script.

1. Open a terminal emulator and establish an SSH session to the target.
2. Open *rc.local* in the vi editor. From the command line type: `vi /etc/rc.d/rc.local`
3. Navigate to the end of the file using Page Down or the down ↓ arrow key.
4. Press the (I) key to enter insert mode.
5. If an empty line is not present at the end of the file, press the Enter key to insert a new line.


**ⓘ IMPORTANT:** Add the *ethtool* command to the end of the file. The intend interface configuration may be overridden if *ethtool* is called prior to `x_Discover_Release` and/or `VideoTrack1500`.

6. Enter the *ethtool* command.

```

192.168.1.93 - Tera Term VT
File Edit Setup Control Window Help
      lighttpd/sbin/lighttpd -f lighttpd/HLS1500.conf -m lighttpd/lib
      ./VideoTrack1500 -Q &
    else
      echo "s1StabTrackOMAP.out not found"
    fi
else
  echo
  #ifup eth0
fi
##
## rtspMain requires that VideoTrack1500 has started so that it can initialize t
##      dhcp may be slow, so adjust the sleep value below
##      VideoTrack1500 was set to run in background above
## to disable RTSP just comment out the rtspMain line below
##
if [ -f rtspMain ]; then
  sleep 5
  ./rtspMain &
else
  echo -e "\e[31mrtspMain not found - RTSP support disabled\e[0m"
fi
ethtool -s eth0 speed 10 duplex full autoneg off
l /etc/rc.d/rc.local [Modified] 204/204 100%
  
```

7. Press the *Escape* key, and then type: `wq`
8. Press the *Enter* key to save the file and exit the vi editor.
9. At the command line, type: `reboot`

 *Auto-negotiation will be enabled during the initial boot process, and the interface will briefly initialize with auto-negotiated parameters once the Linux kernel has loaded. Modifying the interface parameters with *ethtool* may add up to 10 seconds to the startup process.*



### 8.11.2 Startup - 3000-OEM Ethernet Interface Configuration

To set the interface configuration at startup, add an *ethtool* command to the *sla3000\_init.sh* script.

1. Open a terminal emulator and establish an SSH session to the target.
2. Open *sla3000\_init.sh* in the vi editor. From the command line, type: `vi sla3000_init.sh`
3. Navigate to the end of the file using *Page Down* or the down arrow ↓ key.
4. Press the (I) key to enter insert mode.
5. Position the cursor in the empty line between `esac` and `exit 0`.

**ⓘ IMPORTANT:** Add the *ethtool* command to the end of the file. The intend interface configuration may be overridden if *ethtool* is called prior to `x_Discover_Release` and/or `VideoTrack3000`.

6. Enter the *ethtool* command.

```

192.168.1.107 - Tera Term VT
File Edit Setup Control Window Help
    rmod cmenk
    rmod syslink
}
case "$1" in
start)
    start
    ;;
stop)
    stop
    ;;
restart)
    stop
    start
    ;;
*)
    echo "Usage: ./sla3000_init.sh {start|stop|restart}"
    exit 1
    ;;
esac
ethtool -s eth0 speed 10 duplex full autoneg off
exit 0
I sla3000_init.sh [Modified] 118/119 99%

```


7. Press the Escape key, then type: `wq`. Press the Enter key to save the file and exit the vi editor.
8. At the command line, type: `reboot`

*Auto-negotiation will be enabled during the initial boot process. The interface will briefly initialize with auto-negotiated parameters once the Linux kernel has loaded. Modifying the interface parameters with *ethtool* can add up to 10 seconds to the startup process.*



## 8.12 Change Time-To-Live (TTL)

1. Open a terminal emulator and establish an SSH session to the target.
2. Type: `cat /proc/sys/net/ipv4/ip_default_ttl`
3. Confirm value is 64.

 WireShark can also be used to confirm the value.

```
.... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: No
      Total Length: 1344
      Identification: 0x0000 (0)
  > Flags: 0x02 (Don't Fragment)
      Fragment offset: 0
      Time to live: 64
      Protocol: UDP (17)
      Header checksum: 0xb139 [validation disabled]
      [Header checksum status: Unverified]
```

4. Set TTL to new value. Type: `echo "128" > /proc/sys/net/ipv4/ip_default_ttl`

```
192.168.1.80 - Tera Term VT
File Edit Setup Control Window Help
root@sla1500:/# cat /proc/sys/net/ipv4/ip_default_ttl
64
root@sla1500:/# echo "128" > /proc/sys/net/ipv4/ip_default_ttl
root@sla1500:/# cat /proc/sys/net/ipv4/ip_default_ttl
128
root@sla1500:/# █
```

5. Confirm new TTL with Wire Shark.

```
> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
  Total Length: 1344
  Identification: 0x0000 (0)
> Flags: 0x02 (Don't Fragment)
  Fragment offset: 0
  Time to live: 128
  Protocol: UDP (17)
  Header checksum: 0x7139 [validation disabled]
  [Header checksum status: Unverified]
```

6. The `rc.local` (1500-OEM) or `sla3000_init.sh` (3000-OEM) can be modified. This allows the TTL to be set every time the system reboots.



### 8.13 Disable Network Services

Use the table to disable the following network features in the SightLine Hardware. Reboot the target for the settings to take effect.

Starting with 2.23, these files can be edited in the Upgrade Utility subfolder on the host PC. The modified files will be copied to the target during the firmware upgrade process.

**Table 3: Disable Network Services**

Network Feature	Hardware	File to be edited (use vi):	Changes to file:
SSH	1500-OEM	/etc/rc.d/init.d/dropbear	As the second line add: exit 0
	3000-OEM	/etc/init.d/dropbear	Change NO_START=0 to NO_START=1
FTP	1500-OEM	/etc/inetd.conf	Insert # in front of: ftp stream tcp nowait root /usr/sbin/vsftpd vsftpd
	3000-OEM	/etc/rc5.d/S80slaVsFtpd.sh	As the second line add: exit 0
HLS (HTTP Live Streaming)	1500-OEM	/etc/rc.d/rc.local	Comment out (#) the following line: lighttpd/sbin/lighttpd -f lighttpd/HLS1500.conf -m lighttpd/lib
	3000-OEM	/home/root/sla3000_init.sh	Comment out (#) the following lines: mkdir /var/cache/lighttpd lighttpd/sbin/lighttpd -D -f lighttpd/HLS.conf -m lighttpd/lib &
RTSP	1500-OEM	/etc/rc.d/rc.local	Comment out (#) the following lines: if [ -f rtspMain ]; then sleep 5 ./rtspMain & else echo -e "\e[31mrtspMain not found - RTSP support disabled\e[0m" fi
	3000-OEM	/home/root/sla3000_init.sh	Comment out (#) the following lines: if [ -f rtspMain ]; then sleep 5 ./rtspMain & else echo -e "\e[31mrtspMain not found - RTSP support disabled\e[0m" fi



## 9 Questions and Additional Support

If you are still having issues and require additional support, please contact [Technical Support](#). Additional support, documentation and Engineering Application Notes (EANs) can be found on the Support pages of the SightLine Applications [website](#).