

# 11. RVP8/RCP8 Network Export Utilities

The RVP8 communicates to a host computer via a standard TCPIP Ethernet connection. The RCP8 communicates via Ethernet or serial line. This section describes the various network configurations that are supported and the settings to realize them.

Two utilities can be used for the network communication:

- DspExport — exports the dsp library over the network to separate host computers. This is the only way to interface to the RVP8 from a separate computer.
- AntExport — exports the antenna library internal state over the network to a separate host computer. This is a low-bandwidth alternative to running programs like **antenna** and **bitex** with their windows exported over the network. This allows multiple computers to control the antenna simultaneously. SIGMET does not recommend using this in most environments.

With these two utilities users have considerable flexibility for implementing the RVP8, RCP8 and IRIS under many different network and hardware platform scenarios, e.g., the RVP8, RCP8 running on separate PCI systems or in various combinations on the same PCI system. Both the DspExport and AntExport utilities are also used for running remote maintenance utilities over low-speed or high-latency network links for which the X-window export technique is not effective.

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## 11.1 Starting and Stopping DspExport and AntExport

If **DspExport** or **AntExport** are used on a platform, then they should be configured to start automatically when the computer boots. SIGMET's software runs as services in the Linux operating system in order to take advantage of built-in management tools for starting and stopping services. This includes a Graphical User Interface for controlling services and built in support for controlling services at different run levels of the operating system. SIGMET's software should be turned on for the following levels (indicated by an \*).

- 0 Halt
- 1 Single-user mode
- 2 Not used (user-definable)
- 3\* Full multi-user mode
- 4\* Not used (user-definable)
- 5\* Full multi-user mode (with an X-based login screen)
- 6 Reboot

There are several ways to configure how services are started. Sigmet recommends using the command-line utility "chkconfig", but with newer versions of Linux, a GUI program called redhat-config-services can be run as root. The following sections will cover different aspects of starting and stopping both **DspExport** and **AntExport**.

## DspExport Automatic start and Test

As root type:

```
# cp /usr/sigmet/config_template/init/dspexport /etc/init.d/  
# cd /etc/init.d  
# chmod +x dspexport  
# chkconfig --add dspexport
```



**Note:** Systems delivered from the factory or installed using the shipped “Boot and Go” CD will automatically make sure that all of the necessary files and permissions have been set for items in /etc/init.d/.

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To verify that the DspExport service will start automatically, as root, type:

```
#chkconfig --list dspexport  
antexport 0:off 1:off 2:off 3:on 4:on 5:on 6:off
```

At this point, DspExport has been configured to run the next time the computer is restarted. To start DspExport immediately, type the following command as root:

```
# service dspexport start  
starting DspExport: PC Linux [OK]  
#
```

The “OK” message will be displayed if startup occurs smoothly. If this message is not displayed, make sure the above steps have been taken and that the service is not already running.

To verify that DspExport is running type the following line and check that the response matches the one shown below.

```
$ ps -eaf | grep DspExport  
UID      PID  PPID  C   STIME  TTY  TIME      CMD  
operator 4019 1      0   16:05  ?    00:00:08 /usr/sigmet/bin DspExport  
-daemon  
$
```

To stop DspExport, run the following command as root:

```
#service dspexport stop  
Stopping DspExport: [OK]  
#
```

The “OK” message will be displayed if shutdown occurs smoothly.

## AntExport Startup and Test

For AntExport the configuration is similar to DspExport. As root type:

```
# cp /usr/sigmet/config_template/init/antexport /etc/init.d/  
# cd /etc/init.d  
# chmod +x antexport  
# chkconfig --add antexport
```

To verify that the AntExport service will start automatically, as root, type:

```
#chkconfig --list antexport  
antexport 0:off 1:off 2:off 3:on 4:on 5:on 6:off
```

At this point, AntExport has been configured to run the next time the computer is restarted. To start AntExport immediately, type the following command as root:

```
#service antexport start  
Starting AntExport: [OK]  
#
```

The “OK” message will be displayed if startup occurs smoothly. If this message is not displayed, make sure the steps above have been taken and that the service is not already running.

To verify that DspExport is running type the following line and check that the response matches the one shown below.

```
$ ps -eaf | grep AntExport  
operator 4019 1 0 16:05 ? 00:00:08 /usr/sigmet/bin/AntExport -daemon  
$
```

To stop AntExport, run the following command as root:

```
# service antexport stop  
Stopping AntExport: [OK]
```

The above message will be displayed if shutdown occurs smoothly.

## **11.2 Example Network Configurations**

In the examples that follow, various system architecture options are described. For each option, there is a one page summary diagram that shows the basic topology and the specific “setup” responses for the following:

- setup/RVP — the RVP section of the setup utility
- setup/RCP — the RCP section of the setup utility
- RCP8 TTY setups
- RVP8 TTY setups

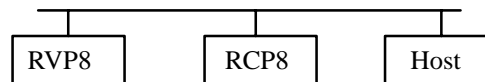
Note that the examples that follow are all for network communication only. There are also two other communications options that have been used on previous SIGMET systems and are still supported in the RVP8 and RCP8.

- Tag angle input to the RVP8 via parallel tags, S/D convertor or serial line.
- RCP8 communication to a host computer via a serial line.

These are covered in Section 11.3 at the end of this chapter.

## 11.2.1 Case 1: Separate PC's for RVP8, RCP8 and Host (e.g., IRIS)

This is a very common architecture used on many systems installed by SIGMET. The advantage of this approach is that the hardware for any of the three units can be upgraded without effecting the other units. When upgrading a legacy system, this is often the easiest approach.



DspExport Running	Yes	No	No
AntExport Running	No	No	No
<b>setup/RVP</b>			
System has signal processor	Yes	No	Yes
Interface to RVP	Native	—	DspExport
Processor Type	RVP8	—	—
DspExport Hostname/IP-Address	—	—	e.g. rvp8
DspExport Port Number	—	—	e.g. 30740
System transmits RTD	From RVP8	No	No
<b>setup/RCP</b>			
System has antenna	Yes	Yes	Yes
Main Interface to RCP	Network	None	Network
Antenna angle insertion source	Normal RCP	Native RCP8	Normal RCP
Is this the 1 controlling host	No	—	Yes
Network Multicast Address	224.0.0.3	—	224.0.0.3
Network Port Number	e.g. 30785	—	e.g. 30785
Network Interface	e.g. eth0	—	e.g. eth0
Average Network Delay	e.g. 0 ms	—	e.g. 0 ms
Receive format from RCP	e.g. RCV02	—	e.g. RCV02
Transmit format to RCP	—	—	e.g. XMT02

### RCP8 TTY Setups “site host”

Connection type for host computer I/O:	Network
Multicast address:	224.0.0.3
Port number:	30785
Network Interface	eth0
Data format transmitted by host	e.g. XMT02
Data format received by host	e.g. RCV02

### DspX RVP8 Setups “mc”

Live angle input – 0:None, 1:Sim, 2:TAGs, 3:S/D : 0

## 11.2.2 Case 2: Separate RVP8, Combined RCP8/RCW (e.g., IRIS Host)

This is perhaps the second most common architecture. Here, the RCP8 and IRIS run on separate threads on the RCP8 platform. The RCP8 has more than enough processing power to perform both tasks.



DspExport Running	Yes	No
AntExport Running	No	No
<b>setup/RVP</b>		
System has signal processor	Yes	Yes
Interface to RVP	Native	DspExport
Processor Type	RVP8	—
DspExport Hostname/IP-Address	—	e.g. rvp8
DspExport Port Number	—	e.g. 30740
System transmits real time display	From RVP8	No
<b>setup/RCP</b>		
System has antenna	Yes	Yes
Main Interface to RCP	Network	Network
Antenna angle insertion source	Normal RCP	Native RCP8
Is this the 1 controlling host	No	Yes
Network Multicast Address	224.0.0.3	224.0.0.3
Network Port Number	e.g. 30785	e.g. 30785
Network Interface	e.g. eth0	e.g. eth0
Average Network Delay	e.g. 0 ms	e.g. 0 ms
Receive format from RCP	e.g. RCV02	e.g. RCV02
Transmit format to RCP	—	e.g. XMT02
<b>Antx RCP8 Setups “site host”</b>		
Connection type for host computer I/O:		Network
Multicast address:		224.0.0.3
Port number:		30785
Network Interface		eth0
Data format transmitted by host		e.g., XMT02
Data format received by host		e.g., RCV02
<b>DspX RVP8 Setups “mc”</b>		
Live angle input – 0:None, 1:Sim, 2:TAGs, 3:S/D : 0		

### 11.2.3 Case 3: Combined RVP8, RCP8/RCW (e.g., IRIS Host)

This is a low cost system computer configuration. The IRIS Host should only output RAW data to one other system and should not generate other products in order to keep PC motherboard and network overhead at a minimum.

RVP8	RCP8	Host
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DspExport Running	No
AntExport Running	No

#### setup/RVP

System has signal processor	Yes
Interface to RVP	Native
Processor Type	RVP8
DspExport Hostname/IP-Address	—
DspExport Port Number	—
System transmits RTD	From RVP8

#### setup/RCP

System has antenna	Yes
Main Interface to RCP	Network
Antenna angle insertion source	Native RCP8
Is this the 1 controlling host	Yes
Network Multicast Address	224.0.0.3
Network Port Number	e.g. 30785
Network Interface	lo
Average Network Delay	0 ms
Receive format from RCP	e.g. RCV02
Transmit format to RCP	e.g. XMT02

#### Antx RCP8 Setups “site host”

Connection type for host computer I/O:	Network
Multicast address:	224.0.0.3
Port number:	30785
Network Interface	lo
Data format transmitted by host	e.g. XMT02
Data format received by host	e.g. RCV02

#### DspX RVP8 Setups “mc”

Live angle input – 0:None, 1:Sim, 2:TAGs, 3:S/D : 0



## 11.2.4 Case 4: Combined RVP8, IRIS Host

This is a special configuration and should only be used with a third party radar controller. The IRIS Host should only output RAW data to one other system and should not generate other products in order to keep PC motherboard and network overhead at a minimum.

RVP8 Host

DspExport Running	No
AntExport Running	No
<b>setup/RVP</b>	
System has signal processor	Yes
Interface to RVP	Native
Processor Type	RVP8
System transmits RTD	From RVP8
<b>setup/RCP</b>	
System has antenna	Yes
Main Interface to RCP	Serial
Antenna angle insertion source	Normal RCP
Is this the 1 controlling host	Yes
Main Serial Device Name	/dev/ttyS0
running at	38400 baud
with parity	none
Receive format from RCP	RCV02
Transmit format to RCP	XMT02
<b>setup/INGEST</b>	
Manner of Angle Acquisition	Binary
Angle Syncing	Dynamic
<b>DspX RVP8 Setups "mc"</b>	
Live angle input – 0:None, 1:Sim, 2:TAGs, 3:S/D : 0	

## 11.2.5 Case 5: AMR with separate Main RCP8 and Host

This configuration is used to support SIGMET Antenna Mounted Receiver Systems for which the RVP8 is in a sealed box above the elevation axis. Communication is via a high-speed wireless LAN. Because of the control and monitoring requirements in the AMR box, the RVP8 also runs an RCP8 “thread” for AMR.



DspExport Running	Yes	No	No
AntExport Running	No	No	No

### setup/RVP

System has signal processor	Yes	No	Yes
Interface to RVP	Native	—	DspExport
Processor Type	RVP8	—	—
DspExport Hostname/IP-Address	—	—	e.g., rvp8
DspExport Port Number	—	—	e.g., 30740
System transmits real time display	No	No	From App

### setup/RCP

System has antenna	Yes	Yes	Yes
Main Interface to RCP	Network	None	Network
Antenna angle insertion source	Normal RCP	Native RCP8	Normal RCP
Is this the 1 controlling host	No	—	Yes
Network Multicast Address	224.0.0.3	—	224.0.0.3
Network Port Number	e.g. 30785	—	e.g. 30785
Network Interface	e.g. eth0	—	e.g. eth0
Average Network Delay	e.g. 0 ms	—	e.g. 0 ms
Receive format from RCP	e.g. RCV02	—	e.g. RCV02
Transmit format to RCP	—	—	e.g. XMT02

### Antx RCP8 Setups “site host”

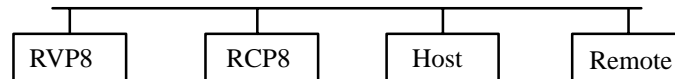
Connection type for host I/O:	Network	Network
Multicast address:	224.0.0.3	224.0.0.3
Port number:	e.g. 30785	e.g. 30785
Network Interface	e.g. eth0	e.g. eth0
Data format transmitted by host	none	XMT02
Data format received by host	none	RCV02
Transmits Internal BITE	No	Yes (0x05)
Transmits AUX BITE	Yes (0x02)	Yes (0x03, for AMR RCP control)
Receives AUX BITE	Yes (0x03)	Yes (0x02, for AMR RCP status)
Transmits Analog Q BITE	Yes (0x0F)	Yes as required

### Dspx RVP8 Setups “mc”

Live angle input – 0:None, 1:Sim, 2:TAGs, 3:S/D : 0

## 11.2.6 Case 6: Separate RVP8, RCP8, IRIS and a remote workstation

This configuration is useful in the case of a remote maintenance workstation that is running on a low-speed link or on a high-latency link such as a geosynchronous satellite.



DspExport Running	Yes	No	No	No
AntExport Running	No	No	Yes	No
<b>setup/RVP</b>				
System has signal processor	Yes	No	Yes	Yes
Interface to RVP	Native	—	DspExport	DspExport
Processor Type	RVP8	—	—	—
DspExport Hostname/IP–Address	—	—	e.g. rvp8	e.g. rvp8
DspExport Port Number	—	—	e.g. 30740	e.g. 30740
System transmits real time display	From RVP8	No	No	No
<b>setup/RCP</b>				
System has antenna	Yes	Yes	Yes	Yes
Main Interface to RCP	Network	None	Network	AntExport
AntExport hostname/IP–Address	—	—	—	e.g. iris
AntExport Port Number	—	—	—	e.g. 30745
Antenna angle insertion source	Normal RCP	Native RCP8	Normal RCP	Normal RCP
Is this the 1 controlling host	No	—	Yes	—
Network Multicast Address	224.0.0.3	—	224.0.0.3	—
Network Port Number	e.g. 30785	—	e.g. 30785	—
Network Interface	e.g. eth0	—	e.g. eth0	—
Average Network Delay	0 ms	—	e.g. 0 ms	e.g., 0 ms
Receive format from RCP	e.g. RCV02	—	e.g. RCV02	—
Transmit format to RCP	—	—	e.g. XMT02	—
<b>Antx RCP8 Setups “site host”</b>				
Connection type for host computer I/O:	Network			
Multicast Address	224.0.0.3			
Port number	e.g. 30785			
Network interface	e.g. eth0			
Data format transmitted by host	e.g. XMT02			
Data format received by host	e.g. RCV02			

## 11.3 Non-Network Antenna Angles to RVP8

On legacy SIGMET processors, the network tag angles were not supported. The three alternative techniques for bringing-in antenna tag angles are supported on the RVP8.

- Parallel binary or BCD “TAGS”
- S/D convertor
- From RVP8 internal simulator

See section 3.2.1 of the *RVP8 User's Manual* for details on the “mc” “Live Angle Input” question. In the case of these selections, the setup/RCP section of the RVP8's **setup** utility should be configured to specify the serial line input as follows:

### setup/RCP

System has antenna	Yes
Main Interface to RCP	None
Antenna angle insertion source	Native RVP8

Another alternative is to use a serial line input to the RVP8. In this case, the “mc” “Live Angle Input” response should be set to “None” and the setup/RCP section of the RVP8 **setup** utility should be configured to specify the serial line input as follows:

### setup/RCP

System has antenna	Yes
Main Interface to RCP	Serial
Antenna angle insertion source	Normal RCP
Is this the 1 controlling host	No
Main serial device name	/dev/ttyS1
Running at	19200
With parity	None
Receive format from RCP	RCV01

## 11.4 RCP8 on Serial Interface

For this architecture, the RCP is connected via a serial line directly to the host computer. The following must be configured for this:

- RCP TTY setups “site host” section of *RCP8 User’s Manual*.
- Host computer setup/RCP configuration (e.g., for IRIS)

### setup/RCP

System has antenna	Yes
Main Interface to RCP	Serial
Antenna angle insertion source	Normal RCP
Is this the 1 controlling host	Yes
Main serial device name	/dev/ttyS1
Running at	19200
With parity	None
Receive format from RCP	RCV02
Transmit format to RCP	XMT02

On the RCP8 itself, the setup/RCP should be set to:

### setup/RCP

System has antenna	Yes
Main Interface to RCP	None
Antenna angle insertion source	Native RCP8

Please refer to the relevant manual sections for information on the details of setting-up a serial line interface. Note that the serial interface on the RCP8 is the identical interface used on the legacy RCP02 and all setup questions are answered as for the RCP02.

The AntExport utility may then be run on the Host computer to export control out to another computer. This works for either RCP8 or the legacy RCP02.