Alias IP Addresses - MCS

All Calrec control processors feature three external Ethernet ports labelled MAC3, MAC4 and MAC5. These ports allow connection to external 3rd party software and equipment, providing external remote control of the Calrec console via the CSCP protocol.

Calrec Serial Control Protocol (CSCP) allows for remote control over mixing console operational functions by third party systems such as video switchers and production automation systems. Features that can be controlled remotely include fader positions, path CUT/ON status, PFLs, routing to Aux and Main busses, and Aux output levels. Currently supported systems include:

- Ross Overdrive
- Mosart
- Sony ELC
- Snell Kahuna
- Grass Valley Ignite

In addition to providing external 3rd party control of a console, these ports also allow for remote connection to H2O (ie: if the console / core is set as a master).

The default Calrec IP addresses for control processor communications are **aaa.bbb.1.0** for the primary and **aaa.bbb.2.0** for the secondary, where the first two octets (**aaa.bbb**) are the hardware ID of the console or core in question.

Direct connections may communicate using these default IP addresses; however if a connection is to be made via external switches and/or routers (ie: via a corporate network), it may be necessary to use an alternative IP address for external communications. This must be defined as an alias IP address. The client may specify a particular IP address they wish to use for external communications. This can be any valid unique IP address that is not reserved for Calrec system use.

If alias IP addresses are to be used, it is important to remember that the primary and secondary control processors must always be configured with values unique to both one another and indeed any 3rd party equipment connected directly or indirectly (ie: connected to the same corporate network or VLAN).

N.B. *The three Ethernet ports share one physical MAC address. See **MAC Address Allocation.pdf** for more details. From software v1.14.6 onwards; if a connection is via a corporate network, the MAC5 port **must** be used.*

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Configuring an alias IP address – using the StudioSetup file

The **studiosetup** file can be used to configure alias IP addresses for both the primary and secondary control processors. This file is automatically copied from the active to inactive processor as part of the standard data replication and redundancy procedures. This means that only one file needs to be modified.

When taking an MCS backup using the Customer Data Backup Utility, the **studiosetup** file is archived to the backup. This file will then be transferred to the target control processor during an MCS restore, ensuring that the alias IP address configuration is not lost when transferring data to a replacement control processor.

1. Connect to the primary control processor via a PuTTY ssh session.

2. Type: **nano /home/MasterControl/MasterControl/StudioSetup [ENT]**

   In the instance of H2O connectivity, the only parameters we are interested in are:

   # ipalias = <AliasName>,<Processor>,<alias IP address>,mask,<netmask>

   Where:
   - **<AliasName>** = the custom name to be used for this alias
   - **<Processor>** = defines which control processor the alias is to be used for. This must be either '**Primary**' or '**Secondary**'
   - **<alias IP address>** = a static IP address to be set as the IP alias for this control processor
   - **mask** = the word '**mask**'. Do not modify this parameter
   - **<netmask>** = the IP netmask to be used for this alias

   The **#** symbol at the beginning of the line should be removed in order to activate this code.

   The primary and secondary control processors must each utilise a unique IP address, however unlike when using the **rc.local** file, both should be entered here. For example:

   ```
   ipalias = alias1,primary,10.20.1.25,mask,255.255.255.0
   ipalias = alias2,secondary,10.20.1.35,mask,255.255.255.0
   ```

   Multiple aliases can be configured per control processor in the same way, so long as the alias name is unique, etc:

   ```
   ipalias = alias3,primary,20.30.5.25,mask,255.255.255.0
   ipalias = alias4,secondary,20.30.5.35,mask,255.255.255.0
   ```

3. Press: **[Ctrl+X]** to save the file and exit nano.

4. Type: **sync [ENT]** to flush all disk caches.

5. The alias IP addresses will now be initialised upon any subsequent boot of the control processors.

In terms of network adapter configuration, the first IP alias (per control processor) is always configured to be **eth0:2** with any additional IP aliases being incremental (ie: **eth0:3**, **eth0:4**, etc)

From v1.14 onwards, any alias IP addresses created in the **studiosetup** file are displayed in the PC application on the **Fixed Options** -> **Ext Control** page.

Alias IP Addresses - MCS

Gateways

Depending upon the customer's corporate network configuration a gateway may also be required in order to allow for control processor communications. This should also be defined within the control processor's **studiosetup** file using the **staticroute** command:

```
# staticroute = target,<Target>,gateway,<gateway>
```

Where: **<Target>** = the defined target or the word '**default**'
<Gateway> = the IP address of a gateway used to reach the defined target

The **#** symbol at the beginning of the line should be removed in order to activate this code.

If the targets are known (ie: the IP address of the 3rd party controller) then they should be entered here. This creates a static route to a permanent target location. It is common for both the primary and secondary connections to utilise the same gateway:

```
staticroute = target,10.30.12.25,gateway,10.20.1.254
staticroute = target,10.30.12.35,gateway,10.20.1.254
```

In the case of H2O connectivity, it is not necessary to list all remote clients instead a default gateway can be configured by using the word '**default**' instead of a specific IP address:

```
staticroute = target,default,gateway,10.20.1.254
```

From v1.14 onwards, any gateways defined in the **studiosetup** file are displayed in the PC application on the **Fixed Options** -> **Ext Control** page.

Further CSCP configuration

All CSCP configurations are also defined in the **studiosetup** file. In addition to configuring the alias IP addresses (and gateway if required) as detailed above, we additionally need to associate these alias IP addresses with a defined CSCP port in order for the control processors to route CSCP communications via the correct IP address using the **cscp_port** and **cscp_protocolalias** commands:

```
# cscp_port = <name>,<port>,<Protocol>,<Enable>

# cscp_protocolalias = <name>,<AliasName>
```

Please see ***CSCP_StudioSetup_Configuration.pdf*** for more details.

From v1.14 onwards, all CSCP configuration information is displayed in the PC application on the **Fixed Options** -> **Ext Control** page.

Alias IP Addresses - MCS

Disabling the Dual Server

Whenever configuring an alias IP address, it is also important to consider the 'dual server' functionality of the control processor. By default Calrec control processors use Dynamic Host Configuration Protocol (DHCP) in order to dynamically distribute IP addresses to connecting hardware (usually a control PC for diagnostics or upgrades).

If a direct connection is employed between the control processor and external destination, DHCP can remain on; however if the connection is indirect or via a corporate network, the 'dual server' functionality **must** be disabled:

1. Connect to the primary control processor via a PuTTY ssh session.
2. Type: **`nano /etc/rc.local [ENT]`**

   An **`rc.local`** file will look similar to this:

   ```
   touch /var/lock/subsys/local
   logrotate -f -s /home/MasterControl/log/logrotate.status
   /home/MasterControl/guardian/logrotate.conf
   cd /home/MasterControl/guardian
   ./CalSFd -debugdmd -debugmcs -daemon -mcs autosave loadlast pack 2

   cd /home/MasterControl/Sioux
   ./siouxStart.sh
   ```

3. The **`rc.local`** file contains a line that begins with **`./CalSFd`** This line defines a number of guardian parameters including the console pack size. In order to turn off DHCP, the argument **`–dualserveroff`** must be included in this line:

   ```
   touch /var/lock/subsys/local
   logrotate -f -s /home/MasterControl/log/logrotate.status
   /home/MasterControl/guardian/logrotate.conf
   cd /home/MasterControl/guardian
   ./CalSFd -debugdmd -debugmcs –dualserveroff -daemon -mcs autosave loadlast pack 2

   cd /home/MasterControl/Sioux
   ./siouxStart.sh
   ```

4. Press: **`[Ctrl+X]`** to save the file and exit nano.
5. Type: **`sync [ENT]`** to flush all disk caches.
6. Repeat the above process for the secondary control processor.

Configuring an alias IP address – using the rc.local file

On older consoles, the legacy method for creating an alias IP address was to use the **`rc.local`** file. This method remains valid and is described below, however is no longer recommended due to the following reasons:

- Alias IP addresses are not shown in the PC application.

Alias IP Addresses - MCS

- When taking an MCS backup using the Customer Data Backup Utility, the **rc.local** file is archived to the backup; however this file will **not** be transferred to the target control processor during an MCS restore. Any alias IP address information will have to be re-configured manually when transferring data to a replacement control processor.
- It is necessary to create the primary and secondary IP aliases individually on the primary and secondary control processors. If a control processor is swapped into the other slot, the IP alias will follow the card.

1. Connect to the primary control processor via a PuTTY ssh session.

2. Type: **nano /etc/rc.local [ENT]**

   An **rc.local** file will look similar to this:

```
touch /var/lock/subsys/local
logrotate -f -s /home/MasterControl/log/logrotate.status
/home/MasterControl/guardian/logrotate.conf
cd /home/MasterControl/guardian
./CalSFd -debugdmd -debugmcs -daemon -mcs autosave loadlast pack 2

cd /home/MasterControl/Sioux
./siouxStart.sh
```

3. Turn off DHCP by adding the argument **–dualserveroff** to the line beginning **./CalSFd**

4. Add the following code at the end of the file to define an alias IP address:

```
ifconfig eth0:x aaa.bbb.ccc.ddd netmask aaa.bbb.ccc.ddd
```

   Where **x** is a unique numerical ID that allows more than one alias IP address to be set (per MCS).

   For example:

```
ifconfig eth0:1 192.178.200.100 netmask 255.255.255.0
ifconfig eth0:2 112.142.60.200 netmask 255.255.255.0
```

5. If a gateway is also required, the gateway IP address should also be defined by adding the following code at the end of the file:

```
route add default gw aaa.bbb.ccc.ddd eth0
```

   An example modified **rc.local** file:

```
touch /var/lock/subsys/local
logrotate -f -s /home/MasterControl/log/logrotate.status
/home/MasterControl/guardian/logrotate.conf
cd /home/MasterControl/guardian
./CalSFd -debugdmd -debugmcs –dualserveroff -daemon -mcs autosave loadlast pack 2

cd /home/MasterControl/Sioux
./siouxStart.sh

ifconfig eth0:1 192.178.200.100 netmask 255.255.255.0
route add default 192.178.200.254 eth0
```

6. Press: **[Ctrl+X]** to save the file and exit nano.

7. Type: **sync [ENT]** to flush all disk caches.

8. Repeat the above process for the secondary control processor.
   N.B. *The secondary alias IP address must be unique from that of the primary*

9. The alias IP addresses will now be initialised upon any subsequent boot of the router cards.

   N.B. *As of v1.14.6,* ***eth0:0*** *should not be used for control processor IP aliases unless the* **ifconfig** *line is immediately proceeded by* **sleep 10**
   Please see ***Calrec Technical Bulletin - H2O alias IP post 1.14.6 and SNMP.pdf*** *for more details*

Using a USB D-Link adapter to provide a unique MAC address

Previous to the MAC address changes in v1.14.6, it was necessary in some exceptions to provide a separate network adapter (with a unique MAC address) via the use of a USB to Ethernet D-Link adapter connected to either of the USB ports labelled USB1 and USB2.

1. Connect to the primary control processor via a PuTTY ssh session.

2. Type: **nano /etc/rc.local [ENT]**

3. Turn off DHCP by adding the argument **–dualserveroff** to the line beginning **./CalSFd**

4. Add the following code at the end of the file to enable the new adapter (**eth1**), then define an alias IP address and gateway if required:

```
ifconfig eth1 up
ifconfig eth1 aaa.bbb.ccc.ddd netmask aaa.bbb.ccc.ddd
route add default gw aaa.bbb.ccc.ddd eth1
```

8. Press: **[Ctrl+X]** to save the file and exit nano.

9. Type: **sync [ENT]** to flush all disk caches.

8. Repeat the above process for the secondary control processor.
   N.B. *The secondary alias IP address must be unique from that of the primary, but must use* ***eth1***

9. The new network adapter will now be initialised upon any subsequent boot of the control processors.

Verifying active IP aliases

1. Connect to a control processor via a PuTTY ssh session.

2. Type: **ifconfig [ENT]** to display the status of the currently active interfaces, including set alias IP addresses and netmasks

3. Type: **route -n [ENT]** to verify a gateway in the routing table