I/O BOX IDENTIFICATION

Each I/O box on the Hydra2 network needs to be given a unique ID in the form of a number between 0 and 255. The Hydra ID, or "HID" for each box is set using a DIP switch accessible from the rear of fixed format I/O boxes, or on the side of the controller card within a modular I/O box.

Label pockets are fitted to the front panel of I/O boxes to aid visual identification.

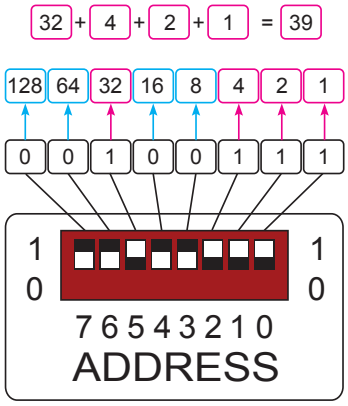
Fixed Format I/O boxes

The 8 way DIP switch is set as an 8 bit binary representation of the HID value with the left hand switch used for the most significant bit, and the right hand switch for the least significant bit. A switch in the down / off position represents a binary 0 and a switch set in the up / on position represents a binary 1. Each switch / binary bit equates to a decimal value, starting at 1 for the least significant bit. The remaining switches are double the value of their less significant neighbor, making the 8th / most significant bit equate to a decimal value of 128.

All fixed format I/O box ID switches are orientated the same way, though some boxes, such as MADI units, use a different style switch with more pronounced labelling. Ignore any labels on the switch itself and always refer to the Calrec labelling on the surrounding panel which will show the most significant bit switch on the left and the binary 1 position as up.

Care should be taken when setting HIDs to avoid accidentally duplicating the same ID on more than one box. Duplicate box IDs can cause network conflicts. I/O boxes should be disconnected from the network before changing their HID, and reset or power cycled once the DIP switch is set to ensure the new HID is active before reconnecting to the network.

STANDARD SWITCH FOR HID SETTING



- The above diagram shows how each switch relates to a decimal value. The setting shown in the example provides a decimal HID value of 39

If replacing an I/O box for any reason, choosing a box of the same type as the original and setting it with the same ID makes it a drop-in replacement which will work with existing user memories and settings, requiring no further configuration.

When connecting additional I/O boxes to a network it is important to be aware of the existing I/O HIDs in order to select a unique number and avoid creating a conflict.

Address 2

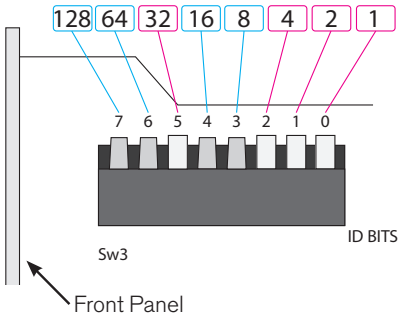
Some I/O boxes, such as MADI units, are fitted with 2 banks of DIP switches—Address 1 and Address 2—to provide a 16 bit ID, and therefore a greater range of values. Please note that only ID values between 0 and 255 are currently supported. Any DIP switches labelled Address 2 should all be set to the off position.

Modular I/O box ID setting

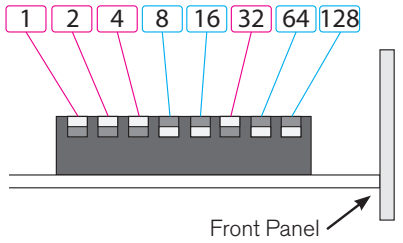
The ID for modular I/O boxes is set by a DIP switch on the controller card and is only accessible by removing the card. Please refer to the Hydra2 installation manual and ensure ESD precautions are observed before removing any modular I/O box cards.

ID switches on modular I/O controller cards are orientated differently. Ignore any labelling on the switch itself and refer to the Calrec labelling printed on the circuit board around the switch to clarify its orientation. When viewing the card from the side, the most significant bit is on the left and the least significant bit on the right. Pulling a switch towards you sets it as a binary 1, away from you as a binary 0. The following illustrations show the ID switch on the modular I/O controller card from the side and top views. Again the decimal value of 39 is used for the example.

MODULAR I/O CONTROLLER - SIDE



MODULAR I/O - VIEWED FROM TOP



FRONT PANEL STATUS LED INFORMATION

LED	Description	Display
PSU	Power Supply Status	**ON SOLID GREEN**—Normal, indicates both PSUs are functioning. **OFF**—One or both PSUs is faulty or has no AC input.
FAN	Fan Status	**OFF**—Normal, internal fan is functioning. **FLASHING RED**—Fan is faulty.
Port 1/2 Con	Hydra port Connection	**ON SOLID YELLOW**—Normal, indicates a valid Hydra2 port connection is made. **OFF**—Hydra2 port connection is not valid.
Port 1/2 Act	Hydra Port Activity	**FLASHING GREEN**—Under normal operation, once the connection is established, this LED should be flashing in a regular pattern, approx 10 times per second. **OFF**—No activity on the Hydra link.
Status 1	Unit Booted & Initialised	**ON SOLID GREEN**—Normal, indicates the unit has booted and the Hydra2 ports are enabled. **OFF**—Unit has failed to boot.
Status 2	Primary Router Heartbeat	**FLASHING GREEN***—Normal, should flash approx 2 times per second. Indicates a valid link between port 1 and a Hydra2 primary router. **OFF or ON SOLID**—Failed link between port 1 and Hydra2 primary router.
Status 3	Secondary Router Heartbeat	**FLASHING GREEN***—Normal, should flash approx 2 times per second. Indicates a valid link between port 2 and a Hydra2 secondary router. **OFF or ON SOLID**—Failed link between port 2 and Hydra2 secondary router.
Status 4	No Function**	
Status 5	Primary Control Data	**ON SOLID RED**—Normal, indicates primary control data connections are established between port 1 and a Hydra2 primary router. **OFF**—Primary control data has failed / cannot be established.
Status 6	Secondary Control Data	**ON SOLID RED**—Normal, indicates secondary control data connections are established between port 2 and a Hydra2 secondary router. **OFF**—Secondary control data has failed / cannot be established.
Status 7	Primary Audio / Sync active	**ON SOLID RED*****—Normal, audio and sync input to the unit active from port 1. **OFF**—Unit is not actively receiving audio / sync via port 1.
Status 8	Secondary Audio / Sync active	**OFF**—Normal, unit is not using audio / sync input from port 2 (secondary / backup) . **ON SOLID RED*****—Unit is using audio and sync from port 2, indicates a problem with the primary path.

- Primary and secondary heartbeat LEDs are often seen to flash synchronously—together, in time with each other, however, this is not important. As long as each LED is flashing approximately twice per second, both ports have an active and reliable comms path with a Hydra router. Under normal boot-up, from power on or reset, the heartbeats will start off in sync with each other. Over time, slight differences in timing between them will lead to the heartbeats being out of sync with each other - this is normal operation. Heartbeats will be out of sync with each other from the start if the system is already booted and the Hydra connections are physically plugged in one at a time.

** The function of status LEDs can be subject to change with software versions. Under some software versions, status LED 4 may light to indicate a PSU issue during bootup and is primarily used by Calrec Engineers for troubleshooting rather than for guidance during normal operation.

*** Status LEDs 7 and 8 may be lit at the same time if an I/O box is receiving signals on its secondary connection.

MODULAR I/O HYDRA2 INTERFACE

Hydra2 interface card
The central card slot of a modular I/O box is reserved for a UJ5836 Hydra2 interface card. This card connects the I/O to a Hydra2 network. Unlike fixed format I/O, the Hydra2 interface connectors are on the front of the modular I/O box.

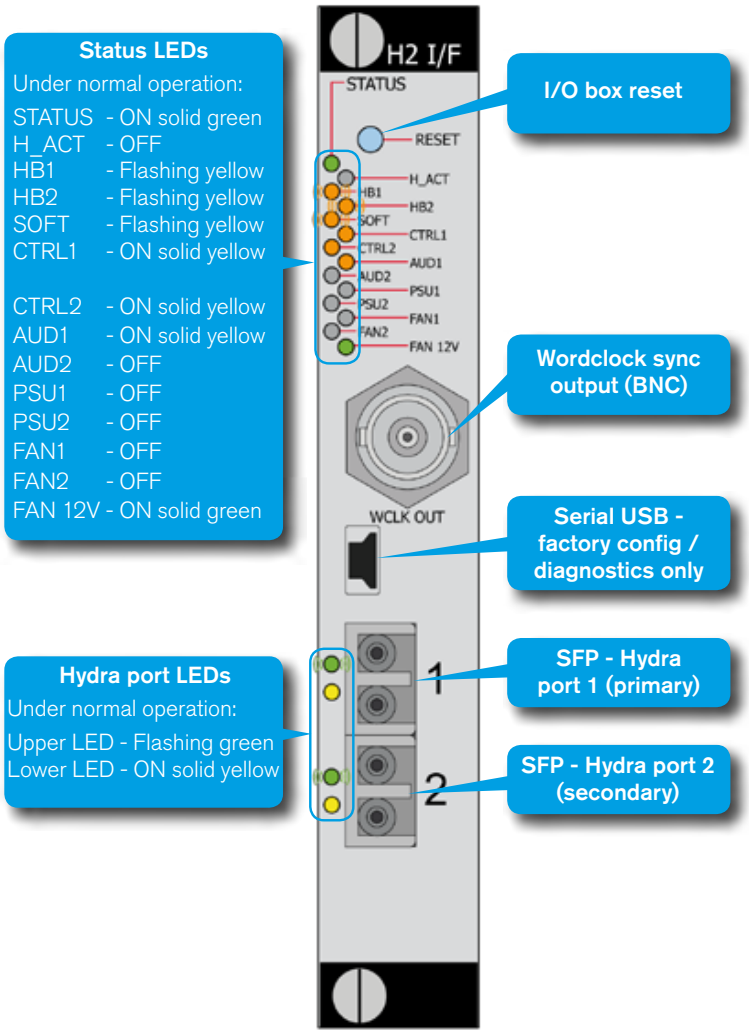
Two Hydra2 interface ports are provided for redundancy - port 1 connects to a primary Calrec router, port 2 to the secondary router in the same core. Hydra2 network components interface via pluggable SFP modules, the correct type of SFP should be ordered to match the installation requirements—Cat5e copper, Singlemode, or MultiMode fibre. Please refer to the section on SFPs for more details.

Modular I/O box ID setting
The ID for modular I/O boxes is set using the DIP switches on the controller card and is only accessible by removing the card. Ensure ESD precautions are observed before removing any modular I/O box cards.

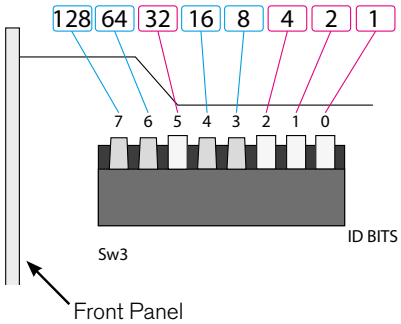
ID switches on modular I/O controller cards are orientated differently. Ignore any labelling on the switch itself and refer to the Calrec labelling printed on the circuit board around the switch to clarify its orientation. When viewing the card from the side, the most significant bit is on the left and the least significant bit on the right. Pulling a switch towards you sets it as a binary 1, away from you as a binary 0. The illustrations on this page show the ID switch on the modular I/O controller card from the side and top views. The decimal value of 39 is used for this example.

Note, always use a non-conductive tool to set the DIP switches to avoid damaging the card.

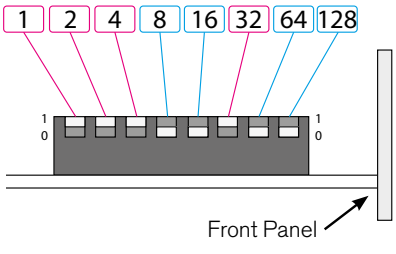
MODULAR I/O HYDRA2 INTERFACE CARD



MODULAR I/O CONTROLLER - SIDE



MODULAR I/O - VIEWED FROM TOP



MODULAR I/O HYDRA INTERFACE LED INFORMATION

LED	Description	Display
STATUS	Boot Status	**ON SOLID GREEN**—Normal, indicates card has booted. **FLASHING GREEN**—Card is booting. **OFF**—Unit has failed to boot.
H_ACT	N/A	**OFF**—Normal, no function assigned to LED.
HB1	Primary Connection Heartbeat	**FLASHING YELLOW**—Normal, flashes approx twice per second. Indicates a valid link between port 1 and a primary router. **OFF or ON SOLID**—Failed or invalid link between port1 and primary router.
HB2	Secondary Connection Heartbeat	**FLASHING YELLOW**—Normal, flashes approx twice per second. Indicates a valid link between port 2 and a secondary router. **OFF or ON SOLID**—Failed or invalid link between port2 and secondary router.
SOFT	Software Heartbeat	**FLASHING YELLOW**—Normal, flashes approx twice per second. Indicates card software is running. **OFF or ON SOLID**—Card software is not running.
CTRL1	Primary Control Data	**ON SOLID YELLOW**—Normal, indicates control data connection between port 1 and primary router. **OFF**—No primary control data connection.
CTRL2	Secondary Control Data	**ON SOLID YELLOW**—Normal, indicates control data connection between port 2 and secondary router. **OFF**—No secondary control data connection.
AUD1	Primary Audio / Sync Active*	**ON SOLID YELLOW**—Normal, using sync and audio inputs via port 1. **OFF** —Unit is not using sync or audio via port 1.
AUD2	Secondary Audio / Sync Active*	**OFF**—Normal, unit is not using sync or audio via port 2. **ON SOLID YELLOW**—Unit is using sync and audio from port 2, indicates a problem with the primary path.
PSU1	PSU #1 Fail Indicator	**OFF**—Normal, I/O box PSU #1 is functioning **ON SOLID RED**—PSU #1 has failed or is not receiving AC mains power.
PSU2	PSU #2 Fail Indicator	**OFF**—Normal, I/O box PSU #2 is functioning **ON SOLID RED**—PSU #2 has failed or is not receiving AC mains power.
FAN1	Fan #1 Fail Indicator	**OFF**—Normal, Fan #1 (fitted to PSU #1) is functioning **ON SOLID RED**—Fan #1 has failed.
FAN2	Fan #2 Fail Indicator	**OFF**—Normal, Fan #2 (fitted to PSU #2) is functioning **ON SOLID RED**—Fan #2 has failed.
FAN 12V	Fan DC Power	**ON SOLID GREEN—**Normal, 12V DC power rail for fans is active. **OFF**—DC power for fans has failed or is inactive.
Port1 Green	Port 1 Activity	**FLASHING GREEN—**Under normal operation, once connection has been established, this LED should display a regular flashing pattern, approx 8 times per second. **OFF**—No activity detected on primary Hydra link.
Port1 Yellow	Port 1 Connection	**ON SOLID YELLOW**—Normal, indicates a valid Hydra2 port connection is made.
Port2 Green	Port 2 Activity	**FLASHING GREEN—**Under normal operation, once connection has been established, this LED should display a regular flashing pattern, approx 8 times per second. **OFF**—No activity detected on secondary Hydra link.
Port2 Yellow	Port 2 Connection	**ON SOLID YELLOW**—Normal, indicates a valid Hydra2 port connection is made.

- AUD1 & AUD2 LEDs may be lit at the same time if the box is receiving some signals on its secondary connection