

Installing or Removing Connections for the DECAM Monsoon Front End Crates

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The DECAM Monsoon crates have the following connections to the outside world:

- C1. AC power cord
- C2. ICS control cable connected to CRio
- C3. glycol cooling line
- C4. dry air line

At the same time each backplane has the following connections in the front panel of the Master Control Board (MCB):

- B1. optical fiber for communications with PAN
- B2. firewire cable for clock daisy chain (In/Out)

These connections have to be undone to remove the imager or made up once the imager is returned to the cage.

B2 Firewire Cables:

The DECAM imager will be installed on the telescope with the crates mounted on it. The B2 connections should already be made at this point. These connections are needed because the clock is generated in the MCB of one backplane and distributed in a chain over the rest of the backplanes. The firewire cable also carries the synchronization signal for the start of the readout of the detectors.

There are 6 backplanes in the readout system. All of them are in the daisy chain except for backplane 2, which corresponds to the guiding system. The guiding system is read without synchronization with the rest of the backplanes.

Each MCB has two firewire connections for the clock/sync signals, those connections are labeled IN and OUT. The first backplane in the chain produces the clock and the firewire for this MCB should be connected to the OUT connector. It then goes to the IN connector of the next backplane in the chain. The first backplane in the chain is called Master and the rest are slaves. The Master/Slave configuration is determined by software. The standard configuration for our system is shown in Fig. 1.

The front panel for a MCB is shown in Fig.2, where the signal and clock connections are clearly labeled.

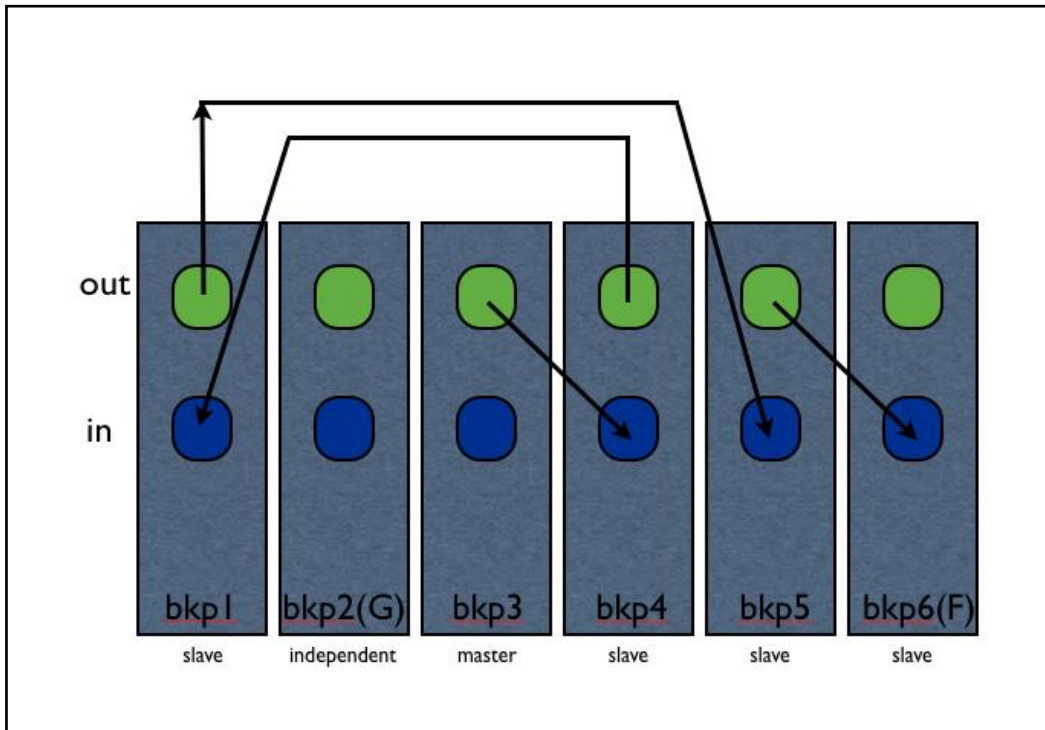


Fig.1 Standard daisy chain configuration for the clock/sync signal

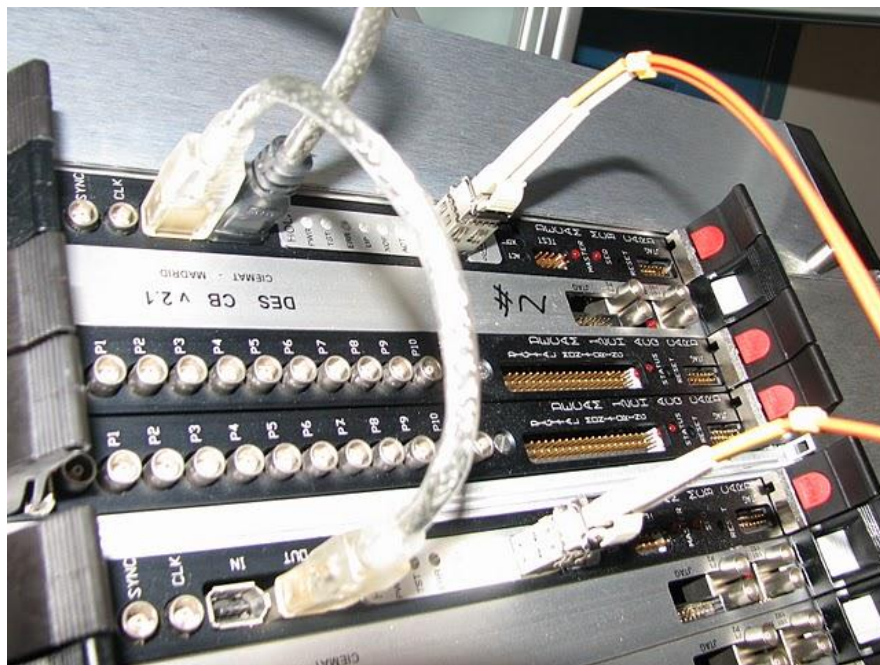


Fig.2 Front panel of the monsoon crate with bkp3 and bkp4. The grey firewire cable distributes the clocks signals among the backplanes. Bkp3 has the firewire connected to OUT only because is the master. The orange fibers provide the communications with the PAN computers.

C3 (Glycol Cooling Lines) and C4 (Dry Air Lines):

The monsoon crates are cooled with glycol using connection C3 and the humidity is kept low by flowing dry air into connection C4. During the installation in the telescope these connections should be done before the back frame is installed. This frame holds the AC distribution power, internet connections, CRio, controls for the shutter etc.

An example of the back of the monsoon crate showing with C3 and C4 connections is shown in Fig. 3. The C4 connection for dry air is only one per crate. The idea is to keep a positive pressure for the dry air inside the crate to avoid condensation. The cooling system has a source C3-S and a return C3-R on each crate. The cooling lines are appropriately labeled.

There is a manifold for the supply and return of glycol and the schematic for it is shown in Fig. 4. The dry air manifold is similar to the one for the supply of the glycol. Figure 5 shows the back of the imager with a complete set of glycol and dry air connections. The connectors are of a self sealing design so one pulls back on the outer collar, then makes or disconnects the joint.

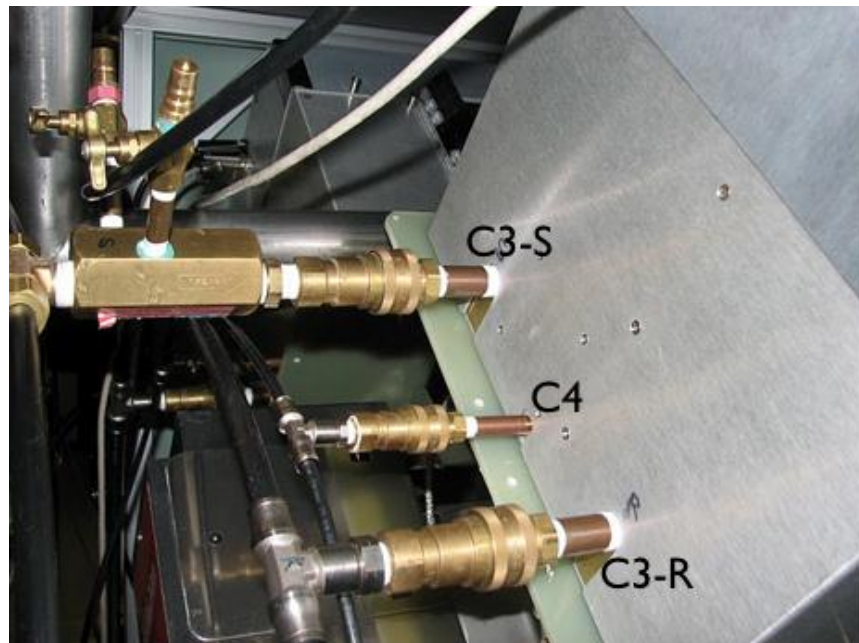


Fig. 3. Back of a readout crate showing the glycol supply (C3-S) and return (C3-R) and the dry air supply (C4).

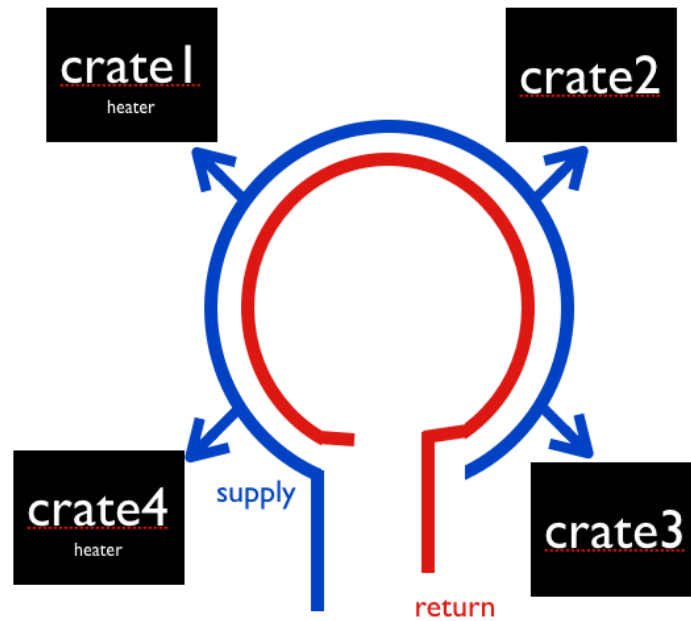


Fig. 4. Schematic for the glycol manifold. The dry air manifold follows the same path.

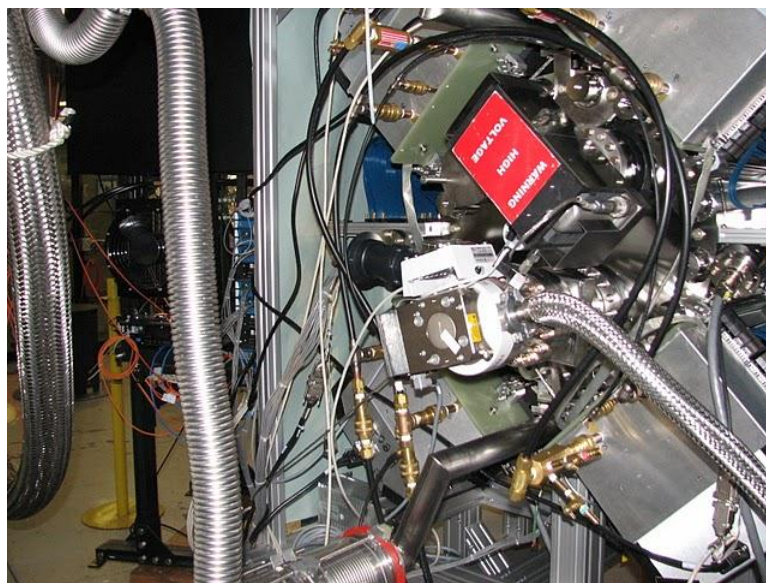


Fig. 5. Photograph from the back of the imager with a complete set of glycol and water connections.

Once the air and glycol connections are completed the next step is to mount the frame holding the AC distribution box, the network connections, the CRio and other instrumentation. The back of the imager with the frame in place is shown in Fig. 6.

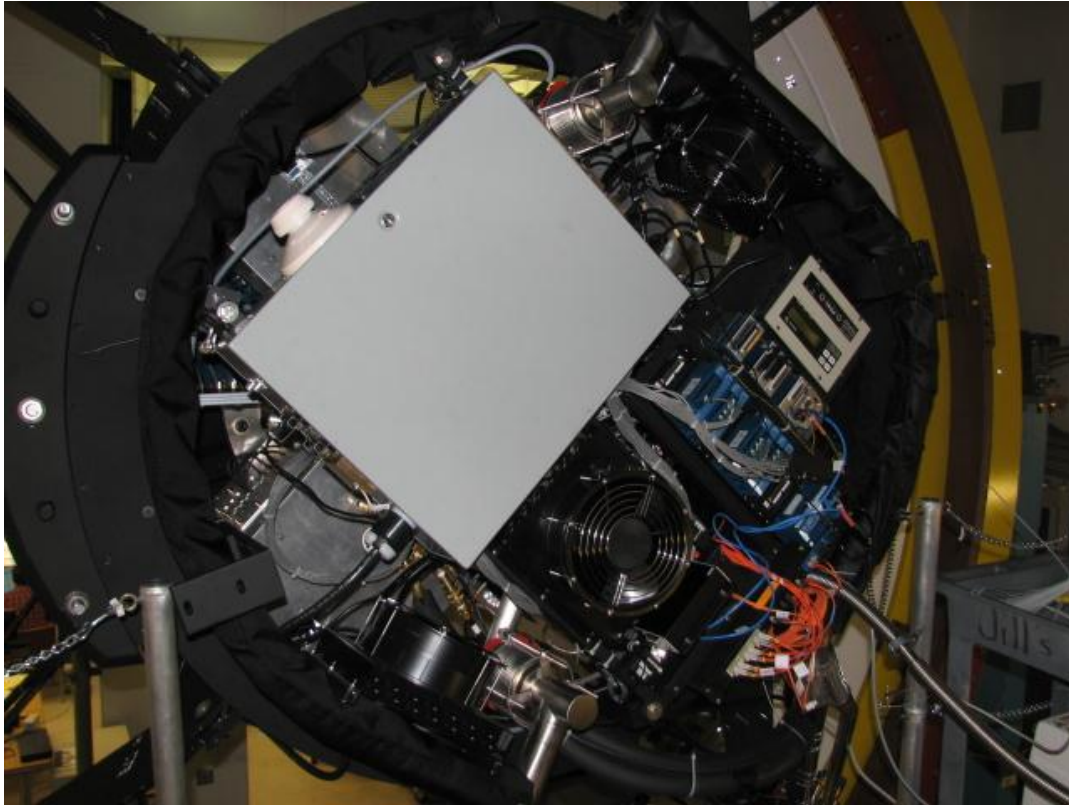


Fig. 6. Back of the imager with frame in place. This photograph was taking during the tests on the telescope simulator and the AC distribution box used at the point was pre-production prototype.

C1 (AC Power Cord) and C2 (ICS Control Cable):

The AC connection can be completed once the frame holding the AC distribution box is in place. On the side of the AC distribution box there are 110V AC outlets clearly labeled for the crates. They include the three readout crates (crates 1,2 and 3) and the heater crate (crate 4). The C1 connection is used for AC power as shown in Fig. 7.

The ICS control connector C2 is right next to the C1 connector. The ICS cable goes from each crate to the CRio mounted on the backframe. The cables from the ICS are clearly labeled and there is one connection for each of the four crates. The C2 connection is also shown in Fig. 7.



Fig. 7. Back of the monsoon crate showing C1 AC connections (black cable) and the C2 ICS control connection (white cable).

B1 (Optical Fiber):

Finally in order to get each backplane connected to a Pixel Acquisition Node (PAN) computer an optical fiber is connected to each MCB on each backplane. There is a total of six fibers, one for each Monsoon backplane. There is no fiber for the heater crate. Each fiber goes from a MCB to a fiber distribution box mounted on the backframe. These connectors on the fiber distribution box are labeled with the crate number. The fiber connections for the MCB are shown in Fig. 2.

Fiber positions are listed below.

Crate 1

- BKPL 1 fiber 1 is the 6 slot
- BKPL 2 fiber 2 is the 4 slot

Crate 2

- BKPL 3 fiber 3 is the 6 slot
- BKPL 4 fiber 4 is the 4 slot

Crate 3

- BKPL 5 fiber 5 is the 6 slot
- BKPL 6 fiber 6 is the 4 slot

Crate numbers should be on the VIB covers. Fiber cables should be label too.