

# IST Slow Control GUI Instruction

## 1. Bring Up the GUI

The main IST GUI (Figure 1) should always be running on IST-OPS2, the PC on the left-hand side to the door when you entering the STAR control room (Display labeled as **IST-OPS2.STARTP.BNL.GOV**). In case it is not running:

- 1- Open a terminal on IST-OPS2 display.
- 2- Login to SC5 with user "sysuser" and password that you should get it from STAR red-book at Control Room.
- 3- Type into the terminal " IST\_GUI\_shiftcrew" and hitting "Enter", the main IST GUI (Figure 1) will pop up.
- 4- The color of the status bar on the right shows whether IST is **ON** (Green) or **OFF** (Red) or **Unknown** (White) status. A text message should tell whether "**IST is READY**" (for physics data taking) or "**IST IS OFF**". **Note: If status bar or any indicator in main GUI is White immediately follow error procedure of "Link to ioc Lost" from failure code section 5 (IV).**

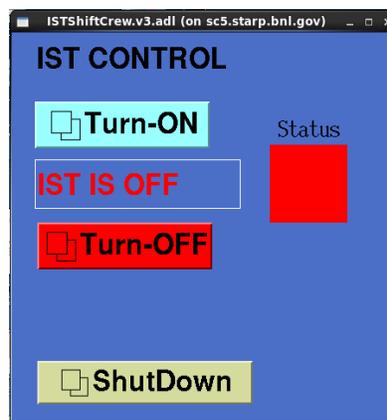


Figure 1 Main IST Shift Crew GUI

## 2. Turning ON IST

**IMPORTANT Note:** Before turning on the IST, Be sure IST cooling systems is ON (Refer to Figure 9). Please check with the shifter leader and the detector status spreadsheet that show when it should be on/off and when it is safe to turn on IST (e.g., make sure that there will be NO change in the beam condition when IST is on). Please remember that the IST is at risk when it is ON. So unless it is absolutely necessary (e.g., physics data taking or calibration), the IST should be in OFF status.

- 1- **Click on "Turn-ON" button in the IST main GUI.** A second window (Figure 2 left) will show up to ask you for confirmation to turn on the IST.
- 2- **Click on "Confirm" button** to start turning on IST. A terminal (Figure 2 right) will show up, automatically executing the commands to turn on the IST. After about 90 seconds, the terminal (Figure 2 right) will disappear. The IST status bar will become Green indicating that turning on

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IST is successful and a “**IST IS READY**” text will appear in main GUI and confirmation windows (Figure 3).

- 3- **Close the confirmation window** (Figure 2 left) and **inform the shifter leader that the IST is turned on.**

**Note:** After the terminal (Figure 2 right) disappears, the status bar on the main GUI should be green with the message “**IST IS READY**”. In case the turn-on process is not successful, a failure flag will show up in the main GUI (see section “Failure Codes and Actions To be Taken”) in this case :

- I. **Close the Turn-on Confirmation window**
- II. **click on the “TURN ON” button on the IST main GUI** again and repeat the above procedure.
- III. If the Issue remains after this second trial, **click on “ShutDown” button on the main GUI** (see section “Emergency Shutdown”) and then **repeat the “Turn ON” procedure**. If this still does not solve the problem, **Click on “ShutDown” button on the main GUI** (see section “Emergency Shutdown”) and **contact the IST on-call expert.**



Figure 2 Left: IST Turn-On Confirmation Window; Right: Pop-up terminal during turn-on.

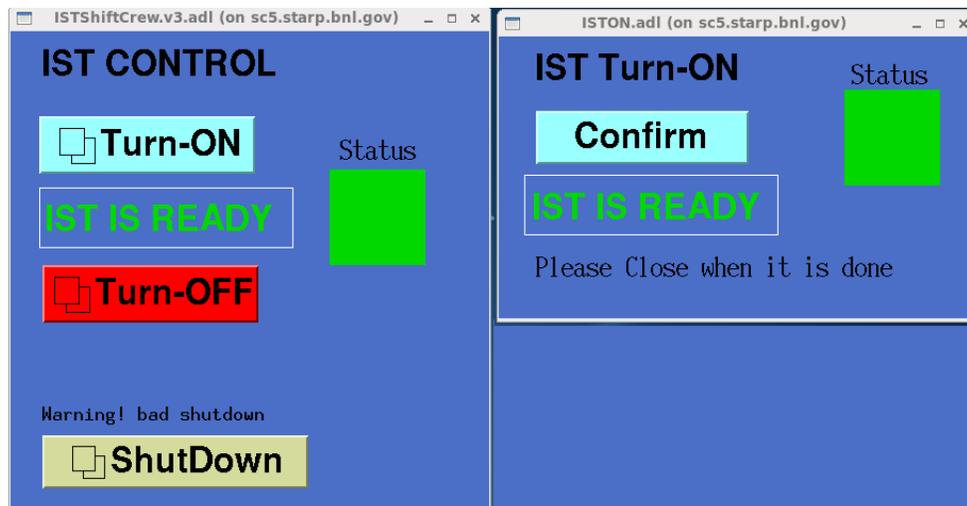


Figure 3 IST Main GUI (Left) and Turn-on Confirmation Window (Right) after IST is successfully turned on.

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### 3. Turning OFF IST

- 1- Click on “Turn OFF” button in the IST main GUI (Figure 1). A window (Figure 4 left) will show up to ask you for confirmation to turn off the IST.
- 2- Click on the “Confirm” button. A terminal (Figure 4 right) will show up, automatically executing the commands to turn off the IST. After about 60 seconds, the terminal (Figure 4 right) will disappear after the last command being executed. The IST status bar will become Red indicating that turning off is successful and “IST IS OFF” (Figure 5).
- 3- Close the Turn-Off confirmation window (Figure 4 right) and inform the shifter leader that the IST is off.

**Note:** After terminal disappears if the status bar does not go to RED or the main GUI shows a failure flag (see section “Failure Codes and Actions To be Taken”) do following steps:

- I. Close the Turn-Off confirmation window (Figure 4 right), then click on “Turn OFF” button again and repeat the above procedure.
- II. If this does not solve the issue, Click on “ShutDown” button on the main GUI (see section “Emergency Shutdown”) and contact the IST on-call expert.



Figure 4 Left: IST Turn-Off Confirmation Window. Right: Pop-up terminal during turn-on.

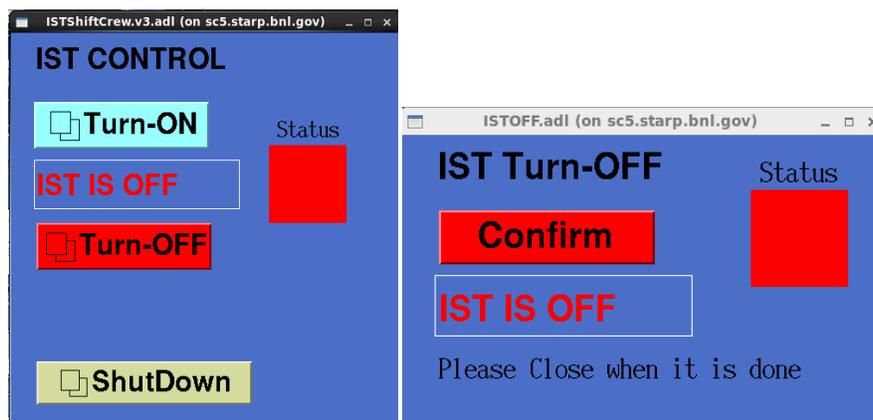


Figure 5 IST Main GUI (Left) and Turn-off Confirmation Window (Right) after IST is successfully turned off

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## 4. Emergency ShutDown

In the situations that you need to turn off the IST very quick consulting with shift leader and the detector status spreadsheet (for instance Magnet trip/ramp or Beam injection is imminent shortly and there is no time to Turn-off IST properly) or in case of appearing the failure code in main GUI (Please follow failure section), you should use Emergency Shut-Down procedure.

- 1- Click on the “ShutDown” button in the main GUI (Figure 1). A new window will pop up (Figure 6).
- 2- Click on the “Confirm” button to Shut Down the IST. This will raise a “warning bad shutdown” text in IST Main GUI, which can be cleared in next IST Turn-on.
- 3- If it did not cleared out follow the failure code section.

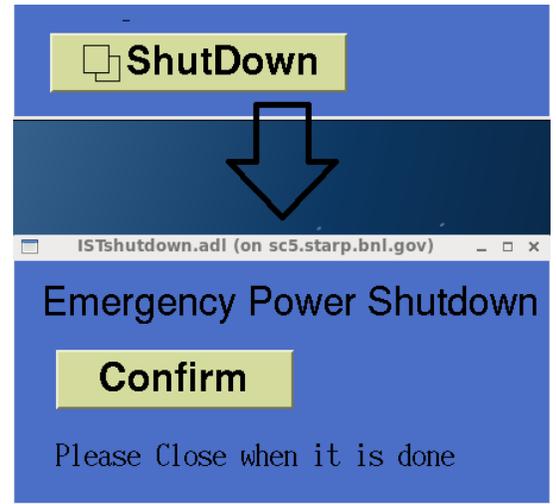


Figure 6

**Note:** After Power ShutDown procedure is done if IST does not go to RED

“IST IS OFF” state as shown in Figure-1 and 2-left or shows a failure flag, You should Turn OFF IST than Trun-ON it again. If this time did not solve the issue than Do **Shutdown** again and contact IST-Experts.

## 5. Failure Codes and Alarms and Actions should be taken

**Note: Any warning or failure even after being fixed MUST be written in shiftlog.**

Following failure codes in case of any problem will appear in main IST GUI as shown in Figure-6 and for these failures will activate an Alarm:

### 1. Failure Code 1:

This will appear if IST is in OFF state but a crate shows power on. To fix this error follow these steps:

- 1- Do a Shutdown procedure, it should clear the error code and show a warning “Warning bad shutdown” in main IST GUI,
- 2- If it did not clear the Failure code 1, try Emergency Shutdown procedure two more times. If the error remains call expert immediately.

### 2. Failure Code 2:

This will appear if IST is in ON state but a crate shows power off or one of the HV channels trips or be shut off due to current limit shutdown or other issue that turns off one or more HV channels. To fix this error follow these steps:

- 1- Do “Turn On” IST again. After procedure is done in a few seconds , “IST IS READY” and green rectangle should be in screen as shown in Figure-3.

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2- If error remains Please Do **Shutdown** procedure than do “Turn On” for second time. After the 2<sup>nd</sup> Turn on if still error remains Do **Shutdown** procedure and call IST-Experts.

**3. Warnings:**

There is warning the “Warning bad shutdown” which will appear after **Shutdown** that should be cleared after first successful turn-on procedure. If it would not be cleared after successful turn-on and appearing green “IST IS READY” please call expert.

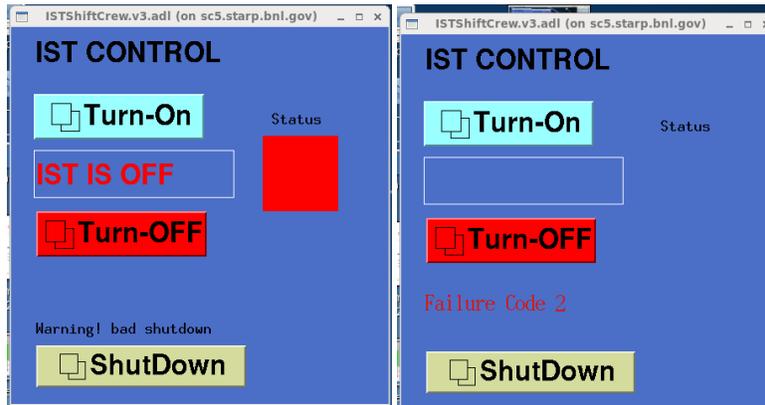


Figure 7

**4. Link to ioc Lost :**

In case of network or ioc issue, Some **white** windows will appear in main GUI or child GUIs as Figure-7. (They are marked with red triangles in Figure-7 to show the places but in real GUI they won't appear). If this status took more than 10 second IST was off do not turn it on contact slow control and IST expert and if IST was in on state :

- I. Immediately inform the shift leader to inform the MCR and make sure that the beam won't be dumped until the IOC problem is solved and IST is ready for beam dump.
- II. Do **ShutDown** procedure and inform shift leader to contact IST and slow control experts. **DO NOT trun-on IST in this status.**

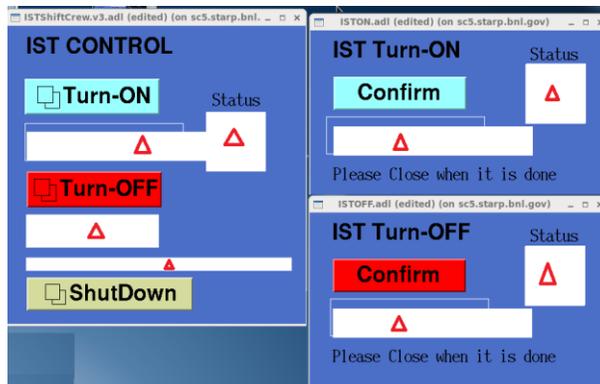


Figure 8

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## 6. IST cooling systems

IST cooling system is On all the times during the run. It is connected to an interlock system which prevents the IST to Trun-on without running cooling systems and any attempt to turn on IST will fail if IST cooling system is off. IST cooling operation is an expert operation. Shift crew should only be sure if the cooling system is on before IST operation by looking at SUM indicator is GREEN as shown in Figure-9.

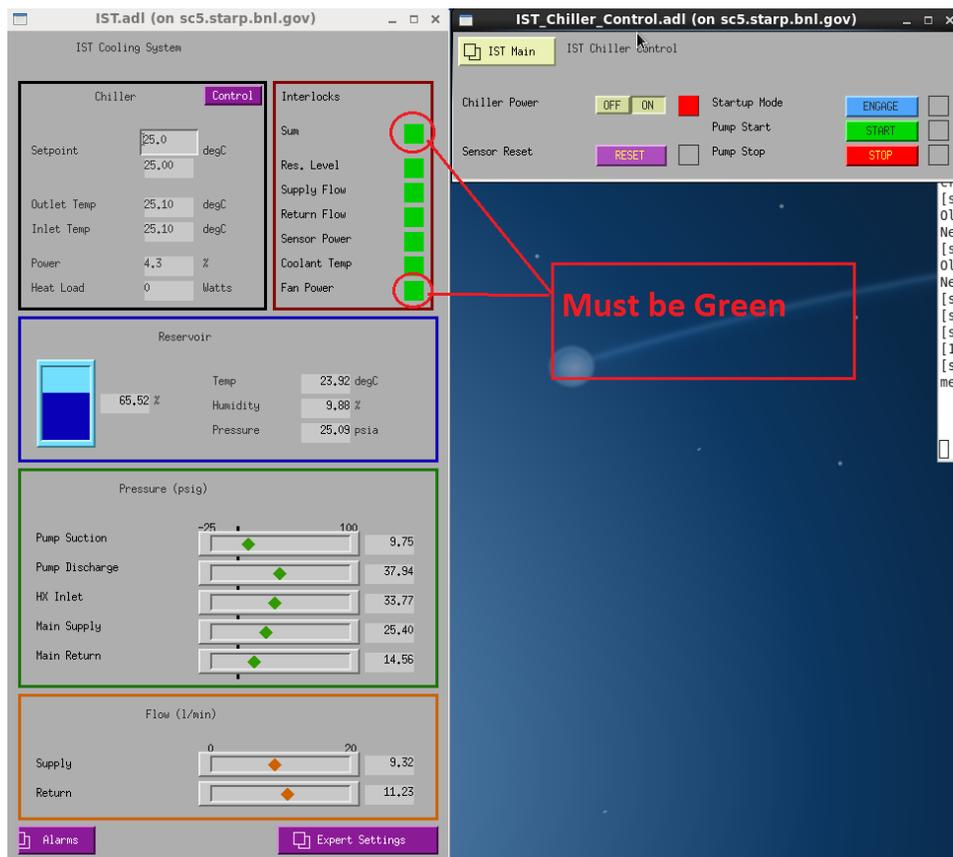


Figure 9 IST cooling system GUI

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