



# IR CAMERA

**Document Title:** Alterations to ESO-Supplied TCCD Controller

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## CHANGE RECORD

Issue	Date	Section(s) Affected	Description of Change/Change Request Reference/Remarks
0.1	14/2/2006	All	New document.

## NOTIFICATION LIST

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## 1 INTRODUCTION

### 1.1 Scope

This document describes the changes made to the hardware of the ESO-supplied TCCD controller

### 1.2 Acronyms and Abbreviations

CCD	Charge Coupled Device
EMC	Electromagnetic Compatibility
ESO	European Southern Observatory
TCCD	Technical CCD (controller)
SDSU	San Diego State University (controller)

### 1.3 Applicable Documents

- [AD1] Wavefront Sensors Autoguider Wiring Diagram, VIS-DES-UOD-06042-0014, Issue 0.5, 21 Nov 2005.
- [AD2] Wavefront Sensors Curvature Sensors Wiring Diagram, VIS-DES-UOD-06042-0013, Issue 0.5, 21 Nov 2005.
- [AD3] Wavefront Sensor Thermal Control using the VISTA TCCD controllers, VIS-TRE-UOD-06042-0025, Issue 0.1, 14 February 2006

## 2 TCCD CONTROLLER WIRING CHANGES

The controller came pre-wired in a default ESO configuration. In order to customise the controller for the WFS module, the pinout of several signals was altered and additional wiring added for extra signals. One controller is required each for the Curvature Sensor and Autoguider, with the CS requiring more signals due to the two CCDs. All controllers are modified to provide identical wiring, thus allowing them to be interchangeable

### 2.1 Video Board to Panel Wiring:

Two additional signals are added: V\_JD and V\_DD. These are both high voltage biases. Their addition resulted in rearranging the pinout of the high voltage DAC, specifically the biases ODL and ODR.

Video connector pin	Original Signal	Panel Connector pin	New Signal	New Panel Connector
1	ODL	9	V_JD	24P
2	ODR	27	V_DD	8S
5	unused	n/a	ODL	9S
6	unused	n/a	ODR	27P

## 2.2 Clock Board to Panel Wiring

One additional clock signal is added:

Clock Connector Pin	Signal	Panel Connector Pin
9	V_SW_A	20P

## 2.3 Power Board to Panel Wiring

The HOT+/- signals have been interchanged with the COLD+/- signals

Power Board TB2	Original Signal	New Signal
1	COLD+	HOT+
2	COLD-	HOT-
3	HOT+	COLD+
4	HOT-	COLD-

## 3 TCCD THERMAL CONTROL

### 3.1 Jumper Settings

There are a number of jumpers present on the TCCD controllers boards that allow the operation of the controller to be customised. The main changes for the VISTA IR Camera are associated with the thermal control hardware and are detailed in the Thermal Control document (AD3).

### 3.2 Resistor Changes

The customisation of the controller for VISTA required an additional resistor to be added to the board, and one surface mount resistor to be removed. These changes are detailed in AD3

## 4 TCCD CONTROLLER THERMAL COVER

Upon testing it was discovered that the thermal coverings for the TCCD controller were only isolated from the controller by the layer of paint coating the metal covers. Due to the repeated

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insertion and removal of the screws, the paint was scraped off in several areas thereby grounding the TCCD chassis to the cryostat. As the TCCD chassis is used as a grounding point for the LOCS/AG electronics, this would cause a ground loop and must be avoided at all costs.

There were two areas of concern; the bottom mounting plate and attaching the upper panel to the side of the controller. In both cases, M4 screws were used. The holes in the side panels were widened to 6mm and an insulating spacer inserted. The holes in the bottom plate were originally countersunk to provide a flush finish and to allow the use of an insulating spacer, the countersinks were bored out to form deeper counterbores and the holes widened.

## 5 TCCD CONTROLLER VOLTAGE RAIL MONITORING (PWR\_CHK)

We found it necessary, particularly on the two LOWFS controllers (each of which clocks a pair of CCDs), to disable the voltage rail monitoring function in the TCCD controller. We assume that the (pair of) CCDs draw slightly too much current pulling one of the voltage rails down to a level where the monitoring circuit detects a problem and turns the controller off. If the PWR\_CHK link is left in its default ('on') position, the controller powers up for approximately half a second before immediately powering down again when sent a "Power On" command. Remove JP11 (PWR\_CHK) on the power supply board to remedy this.

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