

---

# **OSIRIS**

**Optical, Spectroscopic, and Infrared Remote Imaging System**

## **OSIRIS camera tandem ADC offset correction parameters**

RO-RIS-MPAE-TN-088

Issue: 1

Revision: a

17 December 2021

Prepared by:

Gabor Kovacs

---



## Approval Sheet

**Gabor  
Kovacs**

Digitálisan aláírta:  
Gabor Kovacs  
Dátum: 2021.12.20  
14:38:11 +01'00'

---

prepared by: *G. Kovacs* (signature/date)

Digitally signed by  
Holger Sierks  
Date: 2021.12.20  
15:44:50 +01'00'

---

approved by: *H. Sierks* (signature/date)



## Document Change Record

Iss./Rev.	Date	Author	Pages affected	Description
Draft/-	28/06/2017	G. Kovacs	all	first release
1/-	19/02/2018	C. Tubiana	all	Formatted Table 1 Referenced RDs in the text. Removed AD/RDs that are not referenced in the document.
1 / a	17 Dec 2021	C. Güttler	Sect. 2	added clarification and link to RD2



## Table of contents

1	General aspects.....	5
1.1	Scope .....	5
1.2	Introduction .....	5
1.3	Reference Documents .....	5
2	ADC offset correction parameters.....	6

## List of Tables

Table 1	ADC offset correction parameters .....	6
---------	--	---



## 1 General aspects

### 1.1 Scope

This document describes the correction parameters for the OSIRIS NAC and WAC tandem analog-to-digital converter (ADC) offset.

### 1.2 Introduction

Both OSIRIS cameras are equipped with high-resolution (16 bits) CCD readout channels [RD1]. These readout electronics utilize a tandem ADC design of two 14-bit ADCs (ADC-LOW and ADC-HIGH). The readout electronics can use the ADCs separately (either ADC-LOW or ADC-HIGH) or together providing a quasi-16bits dynamical range, which is resolved using a sub-ranging technique. The two ADCs had been adjusted to cover a continuous range linearly. However, there is a few DNs offset between them. The calibration software corrects this offset, as described in the calibration pipeline document [RD2].

### 1.3 Reference Documents

no.	document name	document number, Iss./Rev.
RD1	OSIRIS user manual	RO-RIS-MPAE-MA-004 D/s
RD2	OSIRIS Calibration Pipeline OsiCalliope	RO-RIS-MPAE-MA-007 1/d



## 2 ADC offset correction parameters

The switch point in DN is the value read in LOW channel (ADC-LOW) that is used to switch over to the HIGH channel (ADC-HIGH) when reached and surpassed. Amplifiers A and B allow the readout of CCD on both sides of the output serial register. The content of the CCD can be read out through either amplifier by selecting one amplifier (A or B) or through both amplifiers in concurrent operation, doubling the readout rate. The applied correction is described in [RD2].

The correction constants, determined during the system integration and ground calibration campaigns, are summarized in Table 1.

	<b>NAC</b>	<b>WAC</b>
Switch point (DN)	16383	16383
Single channel readout		
Offset A amplifier (DN)	32	12
Offset B amplifier (DN)	36	12
Dual channel readout		
Offset A amplifier (DN)	44	24
Offset B amplifier (DN)	48	24

**Table 1 ADC offset correction parameters**