

Insta360 I-Log White Paper

June 2026

Contents

Document Version History	1
Introduction	2
Transfer Function	2
Mapping Between Scene Reflectance and Digital Code Values	3
Conversion Specification	3
Gamut	4

Document Version History

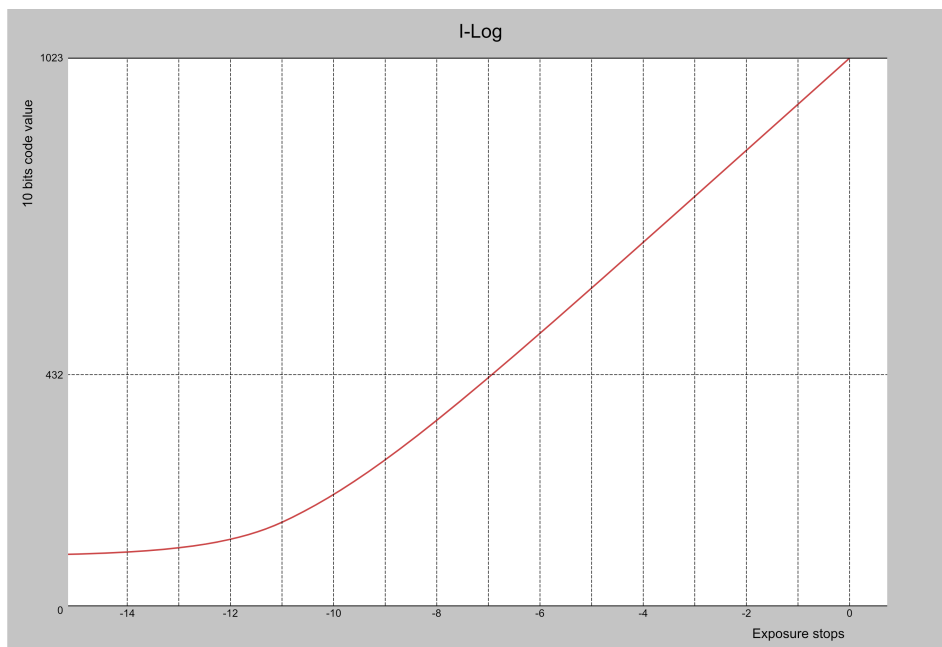
Version	Author(s)	Change Note
2024.09.20	Xie Jundi	Init.
2025.07.07	Zhang Qiushuang	Update new transfer function for 10 bit container
2026.05.20	Zhang Qiushuang	Bug Fix before final release

Introduction

The Insta360 I-Log is a logarithmic gamma curve designed to achieve an exceptionally wide dynamic range while maintaining compatibility with professional cinema production workflows. It allocates digital quantization levels to preserve tonal detail across both highlight and shadow regions of a scene.

Transfer Function

The I-Log transfer function is a scene-referred logarithmic encoding function. The relationship between linear scene reflectance, measured in exposure stops, and the corresponding 10-bit digital code values of the I-Log curve is shown below.



Mapping Between Scene Reflectance and Digital Code Values

Scene reflection	I-Log	
	Float	10-bit Code Value
0%	0.0905593	93
18%	0.422003	432
2200%	1.0	1023

Conversion Specification

The following calculation defines the conversion from scene-linear reflectance to I-Log.

Scene-Linear Reflection to I-Log

$$\tau = 0.01104854$$

$$out = \begin{cases} \alpha * in + \beta & \text{if } in \leq \tau \\ \delta + \eta * \log_{10}(in + \theta) & \text{if } in > \tau \end{cases}$$

I-Log to Scene-Linear Reflection

$$\tau = 0.154402$$

$$out = \begin{cases} \frac{in - \beta}{\alpha} & \text{if } in < \tau \\ 10^{\frac{in - \delta}{\eta}} - \theta & \text{if } in \geq \tau \end{cases}$$

where

$$\alpha = 5.77837328$$

$$\beta = 0.09055934$$

$$\delta = 0.623992$$

$$\eta = 0.280055$$

$$\theta = 0.01$$

Gamut

The RGB primaries, white point, and colorimetric conversions used by I-Log comply with ITU-R BT.2020 standards.

Primary Colors and White Point

	CIE x	CIE y
Red	0.708	0.292
Green	0.170	0.797
Blue	0.131	0.046
White	0.3127	0.329

Additional colorimetric conversions (i.e. between BT.2020 and CIE XYZ) can be found in relevant literature.