

# Servo Controller

Model No. ICE-SC1

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Please read [Limited Warranty](#) and [General Warnings and Cautions](#) prior to operating the ICE-SC1.

## Description

General purpose Servo Controller with PI<sup>2</sup>D loop filter. Secondary auxiliary output is pure integrator of primary output. Both primary output and aux output have min / max settings and adjustable offset. This product is currently in development and all specifications subject to change.

## Absolute Maximum Ratings

Note: All modules designed to be operated in laboratory environment

| Parameter                 | Rating          |
|---------------------------|-----------------|
| Environmental Temperature | >15°C and <30°C |
| Environmental Humidity    | <60%            |
| Environmental Dew Points  | <15°C           |

## Specifications

|                                                                      | ICE-SC1 | Units                           |
|----------------------------------------------------------------------|---------|---------------------------------|
| <b>Side Lock Servo</b>                                               |         |                                 |
| <html> &nbsp;&nbsp;&nbsp;</html>Bandwidth <sup>1)</sup>              | 1       | MHz                             |
| <html> &nbsp;&nbsp;&nbsp;</html>Input Impedance                      | 50      | Ω                               |
| <html> &nbsp;&nbsp;&nbsp;</html>Input Range                          | ±10     | V                               |
| <html> &nbsp;&nbsp;&nbsp;</html>Dither Frequency <sup>2)</sup>       | 4       | MHz                             |
| <html> &nbsp;&nbsp;&nbsp;</html>Phase Shift Resolution <sup>3)</sup> | 5.6     | deg                             |
| <html> &nbsp;&nbsp;&nbsp;</html>Input Voltage Noise <sup>4)</sup>    | TBD     | nV/<br><HTML><br>√Hz<br></HTML> |
| <b>Loop Filter Parameters</b>                                        |         |                                 |

|                                                                     | ICE-SC1      | Units   |     |       |
|---------------------------------------------------------------------|--------------|---------|-----|-------|
| <b>Side Lock Servo</b>                                              |              |         |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>DC Offset Range                     | ±10          | V       |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Proportional Gain (ref to DC Error) | -38 to +30   | dB      |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Proportional Gain Resolution        | 2            | dB      |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>First Integrator                    | 0.030 - 175  | kHz     |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Second Integrator                   | 0.30 - 1,750 | kHz     |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Differential                        | 0.1 - 10,000 | kHz     |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Differential Gain                   | 18           | dB      |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Output Range                        | ±10          | V       |     |       |
| <b>Output Control</b>                                               |              |         |     |       |
| <html> &nbsp;&nbsp;&nbsp;</html>Adjustable Output Limits            | ±10          | V       |     |       |
| <b>Electrical Specifications</b>                                    |              |         |     |       |
|                                                                     | Min          | Typical | Max | Units |
| 5V_A Current Draw                                                   |              | N/A     |     | A     |
| 5V_D Current Draw                                                   |              | 70      |     | mA    |
| +15V Current Draw <sup>5)</sup> (Sidelock)                          |              | 160     | 200 | mA    |
| -15V Current Draw <sup>6)</sup> (Sidelock)                          |              | 120     | 150 | mA    |

## I/O (ICE-BOX)



Only when purchased with the ICE-Box.

The Front Panel for the ICE-SC1 has three SMA connectors. Top: Error In; Middle: Aux Out; Bottom: Primary Out.

### Error In

SMA input for the error signal.

### Aux Out

SMA output for the Auxiliary servo.

### Servo Out

SMA output for the Primary servo.

<sup>1)</sup>  
Calculated based on RF dither frequency of 4 MHz which limits servo bandwidth

<sup>2)</sup> <sup>3)</sup>  
,

Not implemented as of November, 2017

<sup>4)</sup>

Referenced to 50Ω load

[5\)](#) , [6\)](#)

Current draw depends on output load, assuming high impedance. Current may be initially high on power-on

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