PYRAMID 21019 Architecture Der Eiffelturm Instructions

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Contents

FX4 (21019)

FX4 – Programmer Manual

Document ID: 2711715845
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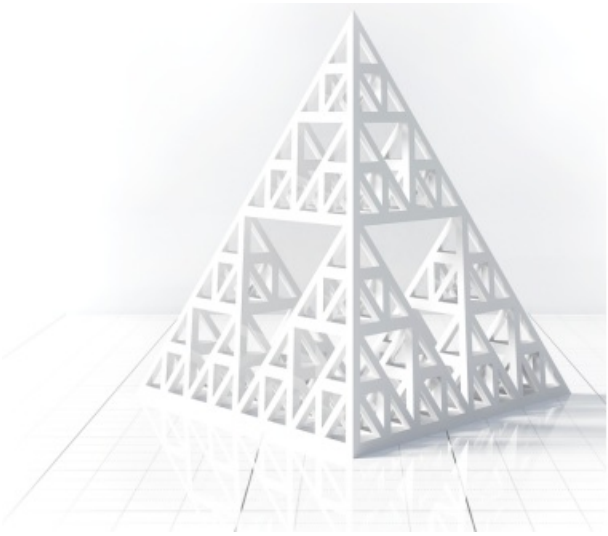

1 Introduction

Document ID: 2711650310

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Owner	Project Lead
Purpose	Explain the programming concepts necessary to use the API and extend the product through external applications.
Scope	FX4 related programming concepts.
Intended Audience	Software developers interested in using the product.
Process	Standard Manual Creation Process
Training	**NOT APPLICABLE**

1.1 References

Document	Document ID	Author	Version
IGX – Programmer Manual	2439249921	@ Matthew Nichols	10

2 FX4 Programming

The concepts and methods described in this manual build on the concepts established in the **IGX – Programmer Manual**. Please see that document for explanation and examples of how basic IGX programming and interfaces work. This manual will only cover the device-specific IO and functionality that is unique to the FX4.

2.1 Analog Input IO

These IO relate to configuring and collecting data on the analog current inputs of the FX4. The units of the channel inputs are based on the user configurable setting called “Sample Units”, valid options include pA, nA, uA, mA, and A.

All 4 channels use the same interface IO and are independently controlled. Replace channel_x with channel_1 , channel_2 , channel_3 , or channel_4 respectively.

IO Path	Description
/fx4/adc/channel_x	**READONLY NUMBER** Measured current input.
/fx4/adc/channel_x/scalar	**NUMBER** Simple unitless scalar applied to the channel, 1 by default.
/fx4/adc/channel_x/ zero_offset	**NUMBER** Current offset in nA for the channel

The following IO are not channel independent and are applied to all channels simultaneously.

IO Path	Description
/fx4/channel_sum	**READONLY NUMBER** Sum of the current input channels.
/fx4/adc_unit	**STRING** Sets the current user units for each channel and sum. Options: “pa”, “na”, “ua”, “ma”, “a”
/fx4/range	**STRING** Sets the current input range. See GUI for how each range code corresponds to the maximum current input limits and BW. Options: “0”, “1”, “2”, “3”, “4”, “5”, “6”, “7”
/fx4/adc/sample_frequency	**NUMBER** The frequency in Hz that sample data will be averaged to. This controls the signal-to-noise and data rate for all channels.
/fx4/adc/ conversion_frequency	**NUMBER** The frequency in Hz that the ADC will convert analog to digital values at. By default, this is 100kHz, and you will only rarely need to change this value.
/fx4/adc/offset_correction	**READONLY NUMBER** Sum of all channel’s current offsets.

2.2 Analog Output IO

These IO relate to the configuration of the general-purpose analog outputs of the FX4 found under the analog inputs on the front panel. All 4 channels use the same interface IO and are independently controlled. Replace channel_x with channel_1 , channel_2 , channel_3 , or channel_4 respectively.

IO Path	Description
/fx4/dac/channel_x	**NUMBER** Command voltage output. This value can only be written to when output mode is set to manual.
/fx4/dac/channel_x/readback	**READONLY NUMBER** Measured voltage output. This is most helpful when using expression output mode.
/fx4/dac/channel_x/output_mode	**STRING** Sets the output mode for the channel. Options: “manual”, “expression”, “process_control”
/fx4/dac/channel_x/slew_control_enable	**BOOL** Enables or disables slew rate limiting.
/fx4/dac/channel_x/slew_rate	**NUMBER** Slew rate in V/s for the channel.
/fx4/dac/channel_x/upper_limit	**NUMBER** The maximum allowed command voltage for the channel. Applies to all operation modes.
/fx4/dac/channel_x/lower_limit	**NUMBER** The minimum allowed command voltage for the channel. Applies to all operation modes.
/fx4/dac/channel_x/output_expression	**STRING** Sets the expression string used by the channel when it is in the expression output mode.
/fx4/dac/channel_x/reset_button	**BUTTON** Resets the command voltage to 0.

2.3 Digital Input and Outputs

⚠ This section is under development.

2.4 Relay Control

⚠ This section is under development.

2.5 High Voltage Module

See the **IGX – Programmer Manual** for details on the FX4 high voltage interface. The component parent path is /fx4/high_votlage .

2.6 Dose Controller

See the **IGX – Programmer Manual** for details on the FX4 dose controller interface. The component parent path is /fx4/dose_controller.

3 Document Control

This document has been reviewed and approved as follows.

Document Control
Current document version: v.5
No reviewers assigned.

3.1 Signatures

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Wednesday, Feb 21, 2024, 11:28 PM UTC
Matthew Nichols signed with meaning **Review**

Version: Working version Document Control

Documents / Resources

	**PYRAMID 21019 Architecture Der Eiffelturm** [pdf] Instructions 21019, 2711715845, 21019 Architecture Der Eiffelturm, 21019, Architecture Der Eiffelturm, Der Eiffelturm, Eiffelturm

References

- Log in with Atlassian account
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- User Manual