

Xilinx SD-FEC Driver

Overview

This driver supports SD-FEC Integrated Block for Zynq Ultrascale+™ RFSocS.

For a full description of SD-FEC core features, see the [SD-FEC Product Guide \(PG256\)](#)

This driver supports the following features:

- Retrieval of the Integrated Block configuration and status information
- Configuration of LDPC codes
- Configuration of Turbo decoding
- Monitoring errors

Missing features, known issues, and limitations of the SD-FEC driver are as follows:

- Only allows a single open file handler to any instance of the driver at any time
- Reset of the SD-FEC Integrated Block is not controlled by this driver
- Does not support shared LDPC code table wraparound

The device tree entry is described in: [linux-xlnx/Documentation/devicetree/bindings/misc/xlnx,sd-fec.txt](#)

Modes of Operation

The driver works with the SD-FEC core in two modes of operation:

- Run-time configuration
- Programmable Logic (PL) initialization

Run-time Configuration

For Run-time configuration the role of driver is to allow the software application to do the following:

- Load the configuration parameters for either Turbo decode or LDPC encode or decode
- Activate the SD-FEC core
- Monitor the SD-FEC core for errors
- Retrieve the status and configuration of the SD-FEC core

Programmable Logic (PL) Initialization

For PL initialization, supporting logic loads configuration parameters for either the Turbo decode or LDPC encode or decode. The role of the driver is to allow the software application to do the following:

- Activate the SD-FEC core
- Monitor the SD-FEC core for errors
- Retrieve the status and configuration of the SD-FEC core

Driver Structure

The driver provides a platform device where the `probe` and `remove` operations are provided.

- `probe`: Updates configuration register with device-tree entries plus determines the current activate state of the core, for example, is the core bypassed or has the core been started.

The driver defines the following driver file operations to provide user application interfaces:

- `open`: Implements restriction that only a single file descriptor can be open per SD-FEC instance at any time
- `release`: Allows another file descriptor to be open, that is after current file descriptor is closed
- `poll`: Provides a method to monitor for SD-FEC Error events
- `unlocked_ioctl`: Provides the following ioctl commands that allows the application configure the SD-FEC core:
 - `:cmacro:XSDFEC_START_DEV`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\

(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 83); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_STOP_DEV'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 84); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_GET_STATUS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 85); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_SET_IRQ'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 86); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_SET_TURBO'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 87); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_ADD_LDPC_CODE_PARAMS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 88); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_GET_CONFIG'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 89); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_SET_ORDER'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\
(linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst,
line 90); [backlink](#)

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- `:c:macro:'XSDFEC_SET_BYPASS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 91); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_IS_ACTIVE'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 92); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_CLEAR_STATS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 93); [backlink](#)

Unknown interpreted text role "c:macro".

- `:c:macro:'XSDFEC_SET_DEFAULT_CONFIG'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 94); [backlink](#)

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Driver Usage

Overview

After opening the driver, the user should find out what operations need to be performed to configure and activate the SD-FEC core and determine the configuration of the driver. The following outlines the flow the user should perform:

- Determine Configuration
- Set the order, if not already configured as desired
- Set Turbo decode, LPDC encode or decode parameters, depending on how the SD-FEC core is configured plus if the SD-FEC has not been configured for PL initialization
- Enable interrupts, if not already enabled
- Bypass the SD-FEC core, if required
- Start the SD-FEC core if not already started
- Get the SD-FEC core status
- Monitor for interrupts
- Stop the SD-FEC core

Note: When monitoring for interrupts if a critical error is detected where a reset is required, the driver will be required to load the default configuration.

Determine Configuration

Determine the configuration of the SD-FEC core by using the ioctl `:c:macro:'XSDFEC_GET_CONFIG'`.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-

devices)xilinx_sdfec.rst, line 128); [backlink](#)

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Set the Order

Setting the order determines how the order of Blocks can change from input to output.

Setting the order is done by using the ioctl `:c:macro:'XSDFEC_SET_ORDER'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 136); [backlink](#)

Unknown interpreted text role "c:macro".

Setting the order can only be done if the following restrictions are met:

- The state member of struct `:c:type:'xsdfec_status <xsdfec_status>'` filled by the ioctl `:c:macro:'XSDFEC_GET_STATUS'` indicates the SD-FEC core has not STARTED

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 140); [backlink](#)

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 140); [backlink](#)

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Add LDPC Codes

The following steps indicate how to add LDPC codes to the SD-FEC core:

- Use the auto-generated parameters to fill the `:c:type:'struct xsdfec_ldpc_params <xsdfe_ldpc_params>'` for the desired LDPC code.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 148); [backlink](#)

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- Set the SC, QA, and LA table offsets for the LPDC parameters and the parameters in the structure `:c:type:'struct xsdfec_ldpc_params <xsdfe_ldpc_params>'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 149); [backlink](#)

Unknown interpreted text role "c:type".

- Set the desired Code Id value in the structure `:c:type:'struct xsdfec_ldpc_params <xsdfe_ldpc_params>'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 150); [backlink](#)

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- Add the LPDC Code Parameters using the ioctl `:c:macro:'XSDFEC_ADD_LDPC_CODE_PARAMS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master)

(Documentation) (misc-devices)xilinx_sdfec.rst, line 151); [backlink](#)

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- For the applied LPDC Code Parameter use the function `:c:func:'xsfec_calculate_shared_ldpc_table_entry_size'` to calculate the size of shared LPDC code tables. This allows the user to determine the shared table usage so when selecting the table offsets for the next LDPC code parameters unused table areas can be selected.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 152); [backlink](#)

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- Repeat for each LDPC code parameter.

Adding LDPC codes can only be done if the following restrictions are met:

- The `code` member of `:c:type:'struct xsdfec_config <xsdfec_config>'` filled by the ioctl `:c:macro:'XSDFEC_GET_CONFIG'` indicates the SD-FEC core is configured as LDPC

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 157); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 157); [backlink](#)

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- The `code_wr_protect` of `:c:type:'struct xsdfec_config <xsdfec_config>'` filled by the ioctl `:c:macro:'XSDFEC_GET_CONFIG'` indicates that write protection is not enabled

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 158); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 158); [backlink](#)

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- The `state` member of `struct :c:type:'xsdfec_status <xsdfec_status>'` filled by the ioctl `:c:macro:'XSDFEC_GET_STATUS'` indicates the SD-FEC core has not started

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 159); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 159); [backlink](#)

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Set Turbo Decode

Configuring the Turbo decode parameters is done by using the ioctl `:c:macro:'XSDFEC_SET_TURBO'` using auto-generated

parameters to fill the `:c:type:'struct xsdfec_turbo <xsdfec_turbo>'` for the desired Turbo code.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 164); [backlink](#)

Unknown interpreted text role "c:macro".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 164); [backlink](#)

Unknown interpreted text role "c:type".

Adding Turbo decode can only be done if the following restrictions are met:

- The `code` member of `:c:type:'struct xsdfec_config <xsdfec_config>'` filled by the ioctl `:c:macro:'XSDFEC_GET_CONFIG'` indicates the SD-FEC core is configured as TURBO

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 168); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 168); [backlink](#)

Unknown interpreted text role "c:macro".

- The `state` member of struct `:c:type:'xsdfec_status <xsdfec_status>'` filled by the ioctl `:c:macro:'XSDFEC_GET_STATUS'` indicates the SD-FEC core has not STARTED

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 169); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 169); [backlink](#)

Unknown interpreted text role "c:macro".

Enable Interrupts

Enabling or disabling interrupts is done by using the ioctl `:c:macro:'XSDFEC_SET_IRQ'`. The members of the parameter passed, `:c:type:'struct xsdfec_irq <xsdfec_irq>'`, to the ioctl are used to set and clear different categories of interrupts. The category of interrupt is controlled as following:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 174); [backlink](#)

Unknown interpreted text role "c:macro".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 174); [backlink](#)

Unknown interpreted text role "c:type".

- `enable_isr` controls the `tlast` interrupts

- `enable_ecc_isr` controls the ECC interrupts

If the `code` member of `:c:type:'struct xsdfec_config <xsdfec_config>'` filled by the ioctl `:c:macro:'XSDFEC_GET_CONFIG'` indicates the SD-FEC core is configured as TURBO then the enabling ECC errors is not required.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 179); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 179); [backlink](#)

Unknown interpreted text role "c:macro".

Bypass the SD-FEC

Bypassing the SD-FEC is done by using the ioctl `:c:macro:'XSDFEC_SET_BYPASS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 184); [backlink](#)

Unknown interpreted text role "c:macro".

Bypassing the SD-FEC can only be done if the following restrictions are met:

- The `state` member of `:c:type:'struct xsdfec_status <xsdfec_status>'` filled by the ioctl `:c:macro:'XSDFEC_GET_STATUS'` indicates the SD-FEC core has not STARTED

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 188); [backlink](#)

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 188); [backlink](#)

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Start the SD-FEC core

Start the SD-FEC core by using the ioctl `:c:macro:'XSDFEC_START_DEV'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 193); [backlink](#)

Unknown interpreted text role "c:macro".

Get SD-FEC Status

Get the SD-FEC status of the device by using the ioctl `:c:macro:'XSDFEC_GET_STATUS'`, which will fill the `:c:type:'struct xsdfec_status <xsdfec_status>'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 198); [backlink](#)

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-

master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 198); [backlink](#)

Unknown interpreted text role "c:type".

Monitor for Interrupts

- Use the poll system call to monitor for an interrupt. The poll system call waits for an interrupt to wake it up or times out if no interrupt occurs.
- On return Poll `revents` will indicate whether stats and/or state have been updated
 - `POLLPR` indicates a critical error and the user should use `:c:macro:'XSDFEC_GET_STATUS'` and `:c:macro:'XSDFEC_GET_STATS'` to confirm

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 205); [backlink](#)

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 205); [backlink](#)

Unknown interpreted text role "c:macro".

- `POLLRDNORM` indicates a non-critical error has occurred and the user should use `:c:macro:'XSDFEC_GET_STATS'` to confirm

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 206); [backlink](#)

Unknown interpreted text role "c:macro".

- Get stats by using the ioctl `:c:macro:'XSDFEC_GET_STATS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 208); [backlink](#)

Unknown interpreted text role "c:macro".

- For critical error the `isr_err_count` or `uecc_count` member of `:c:type:'struct xsdfec_stats <xsdfec_stats>'` is non-zero

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 208); [backlink](#)

Unknown interpreted text role "c:type".

- For non-critical errors the `cecc_count` member of `:c:type:'struct xsdfec_stats <xsdfec_stats>'` is non-zero

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 209); [backlink](#)

Unknown interpreted text role "c:type".

- Get state by using the ioctl `:c:macro:'XSDFEC_GET_STATUS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 210); [backlink](#)

Unknown interpreted text role "c:macro".

- For a critical error the state of `:c:type:'xsfec_status <xsfec_status>'` will indicate a Reset Is Required

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 211); [backlink](#)

Unknown interpreted text role "c:type".

- Clear stats by using the ioctl `:c:macro:'XSDFEC_CLEAR_STATS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 212); [backlink](#)

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If a critical error is detected where a reset is required. The application is required to call the ioctl `:c:macro:'XSDFEC_SET_DEFAULT_CONFIG'`, after the reset and it is not required to call the ioctl `:c:macro:'XSDFEC_STOP_DEV'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 214); [backlink](#)

Unknown interpreted text role "c:macro".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 214); [backlink](#)

Unknown interpreted text role "c:macro".

Note: Using poll system call prevents busy looping using `:c:macro:'XSDFEC_GET_STATS'` and `:c:macro:'XSDFEC_GET_STATUS'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 216); [backlink](#)

Unknown interpreted text role "c:macro".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 216); [backlink](#)

Unknown interpreted text role "c:macro".

Stop the SD-FEC Core

Stop the device by using the ioctl `:c:macro:'XSDFEC_STOP_DEV'`

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 221); [backlink](#)

Unknown interpreted text role "c:macro".

Set the Default Configuration

Load default configuration by using the ioctl `c:macro:XSDFEC_SET_DEFAULT_CONFIG` to restore the driver.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 226); [backlink](#)

Unknown interpreted text role "c:macro".

Limitations

Users should not duplicate SD-FEC device file handlers, for example fork() or dup() a process that has a created an SD-FEC file handler.

Driver IOCTLs

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 236)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_START_DEV
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 237)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_START_DEV
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 240)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_STOP_DEV
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 241)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_STOP_DEV
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 244)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_GET_STATUS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 245)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_GET_STATUS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 248)

Unknown directive type "cmacro".

```
.. c:macro:: XSDFEC_SET_IRQ
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 249)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_SET_IRQ
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 252)

Unknown directive type "cmacro".

```
.. c:macro:: XSDFEC_SET_TURBO
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 253)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_SET_TURBO
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 256)

Unknown directive type "cmacro".

```
.. c:macro:: XSDFEC_ADD_LDPC_CODE_PARAMS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 257)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_ADD_LDPC_CODE_PARAMS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 260)

Unknown directive type "cmacro".

```
.. c:macro:: XSDFEC_GET_CONFIG
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-

master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 261)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_GET_CONFIG
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 264)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_SET_ORDER
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 265)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_SET_ORDER
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 268)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_SET_BYPASS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 269)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_SET_BYPASS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 272)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_IS_ACTIVE
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 273)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_IS_ACTIVE
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 276)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_CLEAR_STATS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 277)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_CLEAR_STATS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 280)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_GET_STATS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 281)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_GET_STATS
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 284)

Unknown directive type "c:macro".

```
.. c:macro:: XSDFEC_SET_DEFAULT_CONFIG
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 285)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:doc: XSDFEC_SET_DEFAULT_CONFIG
```

Driver Type Definitions

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\misc-devices\ (linux-master) (Documentation) (misc-devices)xilinx_sdfec.rst, line 291)

Unknown directive type "kernel-doc".

```
.. kernel-doc:: include/uapi/misc/xilinx_sdfec.h
:internal:
```