The SI476x Driver

TODO for the driver

- According to the SiLabs' datasheet it is possible to update the firmware of the radio chip in the run-time, thus bringing it to the most recent version. Unfortunately I couldn't find any mentioning of the said firmware update for the old chips that I tested the driver against, so for chips like that the driver only exposes the old functionality.

Parameters exposed over debugfs

SI476x allow user to get multiple characteristics that can be very useful for EoL testing/RF performance estimation, parameters that have very little to do with V4L2 subsystem. Such parameters are exposed via debugfs and can be accessed via regular file I/O operations.

The drivers exposes following files:

- /sys/kernel/debug/<device-name>/acf This file contains ACF(Automatically Controlled Features) status information. The contents of the file is binary data of the following layout:

> **System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\admin-guide\media\(linux-master)(Documentation)(admin-guide)(media)si476x.rst, line 36)**
>
> Unknown directive type "tabularcolumns".
>
> ```
> .. tabularcolumns:: |p{7ex}|p{12ex}|L|
> ```

Offset	Name	Description
0x00	blend_int	Flag, set when stereo separation has crossed below the blend threshold
0x01	hblend_int	Flag, set when HiBlend cutoff frequency is lower than threshold
0x02	hicut_int	Flag, set when HiCut cutoff frequency is lower than threshold
0x03	chbw_int	Flag, set when channel filter bandwidth is less than threshold
0x04	softmute_int	Flag indicating that softmute attenuation has increased above softmute threshold
0x05	smute	0 - Audio is not soft muted 1 - Audio is soft muted
0x06	smattn	Soft mute attenuation level in dB
0x07	chbw	Channel filter bandwidth in kHz
0x08	hicut	HiCut cutoff frequency in units of 100Hz
0x09	hiblend	HiBlend cutoff frequency in units of 100 Hz
0x10	pilot	0 - Stereo pilot is not present 1 - Stereo pilot is present
0x11	stblend	Stereo blend in %

- /sys/kernel/debug/<device-name>/rds_blckcnt This file contains statistics about RDS receptions. It's binary data has the following layout:

> **System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\admin-guide\media\(linux-master)(Documentation)(admin-guide)(media)si476x.rst, line 70)**
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> Unknown directive type "tabularcolumns".
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> ```

Offset	Name	Description
0x00	expected	Number of expected RDS blocks
0x02	received	Number of received RDS blocks
0x04	uncorrectable	Number of uncorrectable RDS blocks

- /sys/kernel/debug/<device-name>/agc This file contains information about parameters pertaining to AGC(Automatic Gain Control)

The layout is:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\admin-guide\media\(linux-master)(Documentation)(admin-guide)(media)si476x.rst, line 86)

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Offset	Name	Description
0x00	mxhi	0 - FM Mixer PD high threshold is not tripped 1 - FM Mixer PD high threshold is tripped
0x01	mxlo	ditto for FM Mixer PD low
0x02	lnahi	ditto for FM LNA PD high
0x03	lnalo	ditto for FM LNA PD low
0x04	fmagc1	FMAGC1 attenuator resistance (see datasheet for more detail)
0x05	fmagc2	ditto for FMAGC2
0x06	pgagain	PGA gain in dB
0x07	fmwblang	FM/WB LNA Gain in dB

- /sys/kernel/debug/<device-name>/rsq This file contains information about parameters pertaining to RSQ(Received Signal Quality)

  The layout is:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\admin-guide\media\(linux-master)(Documentation)(admin-guide)(media)si476x.rst, line 111)

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Offset	Name	Description
0x00	multhint	0 - multipath value has not crossed the Multipath high threshold 1 - multipath value has crossed the Multipath high threshold
0x01	multlint	ditto for Multipath low threshold
0x02	snrhint	0 - received signal's SNR has not crossed high threshold 1 - received signal's SNR has crossed high threshold
0x03	snrlint	ditto for low threshold
0x04	rssihint	ditto for RSSI high threshold
0x05	rssilint	ditto for RSSI low threshold
0x06	bltf	Flag indicating if seek command reached/wrapped seek band limit
0x07	snr_ready	Indicates that SNR metrics is ready
0x08	rssiready	ditto for RSSI metrics
0x09	injside	0 - Low-side injection is being used 1 - High-side injection is used
0x10	afcrl	Flag indicating if AFC rails
0x11	valid	Flag indicating if channel is valid
0x12	readfreq	Current tuned frequency
0x14	freqoff	Signed frequency offset in units of 2ppm
0x15	rssi	Signed value of RSSI in dBuV
0x16	snr	Signed RF SNR in dB
0x17	issi	Signed Image Strength Signal indicator
0x18	lassi	Signed Low side adjacent Channel Strength indicator
0x19	hassi	ditto fpr High side
0x20	mult	Multipath indicator
0x21	dev	Frequency deviation
0x24	assi	Adjacent channel SSI
0x25	usn	Ultrasonic noise indicator
0x26	pilotdev	Pilot deviation in units of 100 Hz
0x27	rdsdev	ditto for RDS
0x28	assidev	ditto for ASSI
0x29	strongdev	Frequency deviation

Offset	Name	Description
0x30	rdspi	RDS PI code

- /sys/kernel/debug/<device-name>/rsq_primary This file contains information about parameters pertaining to RSQ(Received Signal Quality) for primary tuner only. Layout is as the one above.