Application Note

AS7261

AT & I²C Commands for AS7261
Overview, status and description

Content Guide

1 General Description

This document describes all AT & I²C commands of AS7261 firmware version NEW (here 11.1.0 or later) and their status compared with older firmware versions. The following codes for status are used:

No change – AT command was not changed in function, syntax, response, etc. No adaptations in firmware are necessary.

Yes Change - AT command was changed in function, syntax, response, etc. An adaptation in firmware are necessary

New – AT command is new and was added in version NEW. The AT command can be used in future for customer firmware.

Deleted – AT command was deleted and does not exists in version NEW. Please, check older firmware and replace the deleted command by alternatives.

Adapted – AT command was changed. Please, check older firmware and adapt firmware t the new command, if necessary.

2 AT Commands Changes in AS7261

Change-Yes/ No/ New/ Deleted	New Command	Description	Changes Compared to Previous
2.1 Status			
No	AT	No operation (NOP) - returns 'OK'-> Success 'ERROR'-> Failure	-
No	ATVERSW	Return the current software version number	-
Yes	ATVERHW	Returns the system hardware as a HEX value of the form PRDTx where P=PartID and R=ChipRevision and DT= DeviceType	one byte changed to two byte and added Device type to LSB byte
No	ATTEMP	Read the current device temperature in degrees Celsius	
No	ATXYZC	Read calibrated X, Y, and Z data (1 decimal position)	
Yes	ATSMALL XYC	Read calibrated x and y for CIE 1931 color gamut (4 decimal position)	Returns 4 decimal positon instead of 5
Yes	ATUVPRI MEC	Read calibrated u', v' and u, v for CIE 1976 color gamut (4 decimal position)	Returns 4 decimal positon instead of 5
Yes	ATDUVC	Read delta uv values (4 decimal position)	Returns 4 decimal positon instead of 5
No	ATCCTC	Return the calibrated CCT value	-

Change-Yes/ No/ New/ Deleted	New Command	Description	Changes Compared to Previous
No	ATLUXC	Read the illumination of the internal sensor in lux	-
Yes	ATDATA	Read all six raw values 65535 means saturation	Added Saturation beyond 65535
2.2 Control			
No	ATINTTIME	Set sensor integration time. Integration time = <value> * ~2.8 ms	-
No	ATGAIN	Set sensor gain: 0=1X gain, 1=3.7X, 2=16X, 3=64X	-
New	ATINTRP	Enable/Disable Interrupt Pin, Default pin state: low (pin disabled) or high (pin enabled). Goes to low when new data are measured. Will be reset to high, if raw data or calibrated data were read	Created Enable/Disable Interrupt Pin, Default pin state: low (pin disabled) or high (pin enabled).
NO	ATTCSMD	Set Measurement mode	-
NO	ATINTRVL	Set the sampling interval as an integer multiple of the Integration time. The <value> is an integer between [1..255]. A sampling interval=1 implies a sampling rate of 1x the current integration time. A sampling interval=255 implies a slow sampling rate of 255 times the current integration time.	-
No	ATBURST	Sends a number of calibrated data without separate requests. The second parameter for the burst mode is optional. Format: Send: ATBURST=10,0 or ATBURST=10 Read: ATBURST => 10,0 OK	Change--------
Yes	ATLED0	Enables or disables the indication led	Changed 0 -Led off , 1 - LED ON(before 100-ON)
Yes	ATLED1	Enables or disables the driver led	Changed 0 -Led off , 1 - LED ON(before 100-ON)
NO	ATLEDC	Sets LED_IND and LED_DRV current	-
New	ATFRST	Factory Reset. Stored values are reset to ‘Factory’ defaults.	Factory reset

Change-Yes/ No/ New/ Deleted	New Command	Description	Changes Compared to Previous
		Afterwards a software reset is started.	
No	ATSRST	Software reset	-
2.3 Calibration Values			
New	ATNORM GAIN	Set/Get the gain with which the calibration values were measured	Set/Get the gain with which the calibration values were measured
New	ATNORM INTT	Set/Get the integration time with which the calibration values were measured	Set/Get the integration time with which the calibration values were measured
New	ATIRXS	Write IR scalar for value X	Write IR scalar for value X
New	ATIRYS	Write IR scalar for value Y	Write IR scalar for value Y
New	ATIRZS	Write IR scalar for value Z	Write IR scalar for value Z
New	ATPMxy	Write 3x3 production matrix to flash, x, y = [0..2]	Write 3x3 production matrix to flash, x,y = [0..2]
New	ATAMxy	Write 3x3 application matrix to flash, x, y = [0..2]	Write 3x3 application matrix to flash, x,y = [0..2]
2.4 Firmware Updates			
No	ATFWU	Starts firmware update process and transfer the bin file checksum	-
No	ATFW	Download new firmware Up to 7 bytes of FW image at a time (14 hex bytes with no leading or trailing 0x) Repeat command till all 56Kbytes of firmware are downloaded	-
No	ATFWS	Tests the checksum on the non-active FW partition and, if correct, switches active partition. This is a toggle and can be used to toggle between the 2 FW partitions. Note: the first 5 bytes in page 0 are not touched. It is only a temporary switch and must be used to check the new firmware whether the communication works!	-
New	ATFWL	This command locks the current firmware to starts on power cycles. It rewrites the first five bytes in page0!	This command locks the current firmware to starts on power cycles. It rewrites the first five bytes in page0!

Change-Yes/ No/ New/ Deleted	New Command	Description	Changes Compared to Previous
New	ATFWC	This command gives information about the current firmware state	This command gives information about the current firmware state
NO	ATFWA	Only for backward compatibility to support old firmware, update mechanism. Always returns with OK. Because of flash devices, it is not possible to increment the address separately (Page erase necessary!)	-
Deleted	ATXYZR	-	-

3 I²C command for AS7261 with the changes and modifications

Change Yes/ No/ New/ Deleted	Old Command	Old Addr.	New Command	New Addr.	Description	Changes based on Previous release
Yes	HW_Version	0x00: 0x01	HW_VERSION_H	0x00	Device type	Two separate registers created - Device Type
			HW_VERSION_L	0x01	HW version	- HW Version
Yes	FW_Version	0x02: 0x03	FW_VERSION_H	0x02	Set register 0x02 or 0x03 to 1-3 to get each firmware positions high byte 1: MAJOR version [15..8] 2: PATCH version [15..8] 3: BUILD version [15..8] Other write values set registers 0x02/0x03 to zero	Two separate registers created - Functions as described in description
			FW_VERSION_L	0x03	Set register 0x02 or 0x03 to 1-3 to get each firmware positions low byte 1: MAJOR version [7..0] 2: PATCH version [7..0] 3: BUILD version [7..0] Other write values set registers 0x02/0x03 to zero	

Change Yes/ No/ New/ Deleted	Old Command	Old Addr.	New Command	New Addr.	Description	Changes based on Previous release
Yes	Control _ Setup	0x04	CONFIGURATION	0x04	[7] SRST: [W] software reset [R] gain error [6] INT: [R/W] enable interrupt pin [5:4] GAIN: [R/W] gain configuration: b00=1x; b01=3.7x; b10=16x; b11=64x [3:2] BANK: [R/W] measurement mode: b00=Mode 0: 4 channels b01=Mode 1: 4 channels b10=Mode 2: all 6 channels b11=Mode 3: One-Shot operation of mode 2 [1] DATA_RDY: [R] data ready to read [0] FRST: [W] factory reset	[7] RST: [W] software reset [R] [6] INT: [R/W] enable interrupt pin [5:4] GAIN: [R/W] gain configuration: b00=1x; b01=3.7x; b10=16x; b11=64x [3:2] BANK: [R/W] measurement mode: b00=Mode 0: 4 channels b01=Mode 1: 4 channels b10=Mode 2: all 6 channels b11=Mode 3: One-Shot operation of mode 2 [1] DATA_RDY: [R] data ready to read [0] RSVD: [W] factory reset
Yes	INT_T	0x05	INTEGRATION_ TIME	0x05	Integration time	Name changed
Yes	Device_ Temp	0x06	TEMPERATURE	0x06	Temperature of the device in °C Read value from every device in dependency of register DEV_SEL	Name changed
Yes	LED_ Control	0x07	LED_CONFIG	0x07	[7] [R] READ_ERR: error while reading status [6] not used [5:4] LED_DRV current limit: b00=12.5mA; b01=25mA; b10=50mA; b11=100mA [3] Enable LED_DRV [2:1] LED_IND current limit: b00=1mA; b01=2mA; b10=4mA; b11=8mA [0] Enable LED_IND Read/Write value from every device in dependency of register DEV_SEL	[7:6] RSVD [5:4] ICL_DRV current limit: b00=12.5mA; b01=25mA; b10=50mA; b11=100mA [3] Enable LED_DRV [2:1] ICL_IND current limit: b00=1mA; b01=2mA; b10=4mA; b11=8mA [0] Enable LED_IND
Yes	X_High	0x08	RAW_VALUE_0 _H	0x08	X Channel High Data Byte	Name changed

Change Yes/ No/ New/ Deleted	Old Command	Old Addr.	New Command	New Addr.	Description	Changes based on Previous release
Yes	X_Low	0x09	RAW_VALUE_0_L	0x09	X Channel Low Data Byte	
Yes	Y_High	0x0A	RAW_VALUE_1_H	0x0A	Y Channel High Data Byte	Name changed
Yes	Y_Low	0x0B	RAW_VALUE_1_L	0x0B	Y Channel Low Data Byte	
Yes	Z_High	0x0C	RAW_VALUE_2_H	0x0C	Z Channel High Data Byte	Name changed
Yes	Z_Low	0x0D	RAW_VALUE_2_L	0x0D	Z Channel Low Data Byte	
Yes	NIR_High	0x0E	RAW_VALUE_3_H	0x0E	NIR Channel High Data Byte	Name changed
Yes	NIR_Low	0x0F	RAW_VALUE_3_L	0x0F	NIR Channel Low Data Byte	
Yes	Dark_High	0x10	RAW_VALUE_4_H	0x10	DK Channel High Data Byte	Name changed
Yes	Dark_Low	0x11	RAW_VALUE_4_L	0x11	Dk Channel Low Data Byte	
Yes	Clear_High	0x12	RAW_VALUE_5_H	0x12	CL Channel High Data Byte	Name changed
Yes	Clear_Low	0x13	RAW_VALUE_5_L	0x13	Cl Channel Low Data Byte	
Yes	Cal_X	0x14	CAL_X_0	0x14	Calibrated X data (4-byte floating-point)	Name changed
		0x15	CAL_X_1	0x15	-	
		0x16	CAL_X_2	0x16	-	
		0x17	CAL_X_3	0x17	-	
Yes	Cal_Y	0x18	CAL_ Y_0	0x18	Calibrated Y data (4-byte floating-point)	Name changed
		0x19	CAL_ Y_1	0x19	-	
		0x1A	CAL_ Y_2	0x1A	-	
		0x1B	CAL_ Y_3	0x1B	-	
Yes	Cal_Z	0x1C	CAL_Z_0	0x1C	Calibrated Z data (4-byte floating-point)	Name changed
		0x1D	CAL_Z_1	0x1D	-	
		0x1E	CAL_Z_2	0x1E	-	
		0x1F	CAL_Z_3	0x1F	-	
Yes	Cal_x_1931	0x20	CAL_SMALL_X_0	0x20	Calibrated x (CIE 1931) (4-byte floating-point)	Name changed
		0x21	CAL_SMALL_X_1	0x21	-	
		0x22	CAL_SMALL_X_2	0x22	-	
		0x23	CAL_SMALL_X_3	0x23	-	
Yes	Cal_y_1931	0x24	CAL_SMALL_Y_0	0x24	Calibrated y (CIE 1931) (4-byte floating-point)	Name changed
		0x25	CAL_SMALL_Y_1	0x25	-	
		0x26	CAL_SMALL_Y_2	0x26	-	

Change Yes/ No/ New/ Deleted	Old Command	Old Addr.	New Command	New Addr.	Description	Changes based on Previous release
		0x27	CAL_SMALL_Y_3	0x27	-	
Yes	Cal_upri	0x28	CAL_U_PRIME_0	0x28	Calibrated u’ (CIE 1976) (4-byte floating-point)	Name changed
		0x29	CAL_U_PRIME_1	0x29	-	
		0x2A	CAL_U_PRIME_2	0x2A	-	
		0x2B	CAL_U_PRIME_3	0x2B	-	
Yes	Cal_vpri	0x2C	CAL_V_PRIME_0	0x2C	Calibrated v’ (CIE 1976) (4-byte floating-point)	Name changed
		0x2D	CAL_V_PRIME_1	0x2D	-	
		0x2E	CAL_V_PRIME_2	0x2E	-	
		0x2F	CAL_V_PRIME_3	0x2F	-	
Yes	Cal_u	0x30	CAL_SMALL_U_0	0x30	Calibrated u (CIE 1976) (4-byte floating-point)	Name changed
		0x31	CAL_SMALL_U_1	0x31	-	
		0x32	CAL_SMALL_U_2	0x32	-	
		0x33	CAL_SMALL_U_3	0x33	-	
Yes	Cal_v	0x34	CAL_SMALL_V_0	0x34	Calibrated v (CIE 1976) (4-byte floating-point)	Name changed
		0x35	CAL_SMALL_V_1	0x35	-	
		0x36	CAL_SMALL_V_2	0x36	-	
		0x37	CAL_SMALL_V_3	0x37	-	
Yes	Cal_DUV	0x38	DUV_0	0x38	Calibrated DUV (CIE 1976) (4-byte floating-point)	Name changed
		0x39	DUV_1	0x39	-	
		0x3A	DUV_2	0x3A	-	
		0x3B	DUV_3	0x3B	-	
Yes	Cal_LUX	0x3C: 0x3F	LUX_H	0x3C	Calibrated LUX (16bit unsigned)	Instead of 4 bytes only two bytes used and name changed
			LUX_L	0x3D	-	
Yes	Cal_CCT	0x40: 0x4F	CCT_H	0x3E	Calibrated CCT (16bit unsigned)	Instead of 4 bytes only two bytes used and name changed
			CCT_L	0x3F	-	
-	-		not used	0x40	-	
-	-		not used	0x41	-	
-	-		not used	0x42	-	
-	-		not used	0x43	-	

Change Yes/ No/ New/ Deleted	Old Command	Old Addr.	New Command	New Addr.	Description	Changes based on Previous release
-	-		not used	0x44	-	
-	-		not used	0x45	-	
-	-		not used	0x46	-	
-	-		not used	0x47	-	
New	-		FW_CNTRL	0x48	[7] START [R/W]: set bit once to configure the device for firmware update [6] STOP [W]: Reset firmware update state machine [5] BYTES_TRANSFERED [R]: all 56kBytes are transferred [4] LOCK [R/W]: Lock this firmware for next start [3] SWITCH [W]: Switch between both firmware [2] BANK1 [R]: Set if bank 1 is active, else bank 2 [1] ERROR [R]: error occurred while firmware update [0] CHKSUM [R]: Checksum of other bank is valid	Refer Description for details
New	-		FW_BYTE_COUNT_H	0x49	Byte counter of transferred image	Refer Description for details
New	-		FW_BYTE_COUNT_L	0x4A	-	
New	-		FW_PAYLOAD	0x4B	Transfer of the firmware byte	Refer Description for details
New	-		not used	0x4C	-	
New	-		not used	0x4D	-	
New	-		not used	0x4E	-	
New	-		not used	0x4F	-	
New	-	0x50	COEF_DATA_0	0x50	Data heap to read and write calibration data	Refer Description for details
New	-	0x51	COEF_DATA_1	0x51	-	
New	-	0x52	COEF_DATA_2	0x52	-	
New	-	0x53	COEF_DATA_3	0x53	-	
New	-	0x54	COEF_READ	0x54	Set sub addresses to read different calibration data from COEF_DATA register	Refer Description for details
New	-	0x55	COEF_WRITE	0x55	Set sub addresses to write different calibration data from COEF_DATA register to persistent memory	Refer Description for details

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6 Revision Information

Changes from previous version to current revision 11-01 (2018-May-04)	Page
Initial version 1-00	

Note: Page numbers for the previous version may differ from page numbers in the current revision.
Correction of typographical errors is not explicitly mentioned.