

SparkFun Qwiic Optical Tracking Odometry Sensor Register Map

Address	Name	Access	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Description	
0x00	Product ID	R	0	1	0	1	1	1	1	1	Unique product ID, fixed at 0x5F.	
0x01	Hardware Version	R	Hardware Version Number, Major				Hardware Version Number, Minor				Hardware and firmware versions. Formatted as vX.Y where X and Y are defined by the left and right 4 bits respectively (eg. 0x10 is v1.0).	
0x02	Firmware Version	R	Firmware Version Number, Major				Firmware Version Number, Minor					
...	Reserved		Reserved								Reserved for potential future use	
0x04	Linear Scalar	R/W	Linear Scalar								Scaling factor for linear and angular measurements. Signed 8-bit values with resolution of 0.1%, resulting in range of 0.872 to 1.127.	
0x05	Angular Scalar	R/W	Angular Scalar									
0x06	IMU Calibration	R/W	IMU Calibration Number of Samples								Write a non-zero value to this register to re-calibrate the IMU offsets. Value is the number of samples to measure, and decrements until completion. Each sample takes about 2.4ms as of firmware v1.0, so the max of 255 samples takes about 612ms.	
0x07	Reset	R/W	Reserved								Reset Tracking	Set bits in this register to perform corresponding reset operation: Reset Tracking - Reset tracking algorithm (resets internal Kalman filters)
...	Reserved		Reserved									Reserved for potential future use
0x0E	Signal Process Config	R/W	Reserved				Enable Variance	Enable Rotation	Enable Accelerometer	Enable Lookup Table	Enable or disable parts of the signal processing: Lookup Table - Whether to use the lookup table calibration for the optical sensor Accelerometer - Whether to use the accelerometer data in the sensor fusion Rotation - Whether to rotate the linear measurements by the measured heading Variance - Whether to use the noise variance of each sensor (clearing this bit effectively disables the Kalman filter, resulting in raw data)	
0x0F	Self Test	R/W	Reserved				Fail	Pass	In Progress	Start	Set Start bit to perform self test. In Progress bit will remain high while test is active. Once complete, either the Pass or Fail bit will be set to indicate result.	
0x10	Offset X_L	R/W	Offset Position X Low Byte				Offset Position X High Byte				X offset position, signed 16-bit. Full scale range of +/-10m, resulting in resolution of about 0.0003 meters. Burst write to all offset registers to set new offset.	
0x11	Offset X_H	R/W										
0x12	Offset Y_L	R/W	Offset Position Y Low Byte				Offset Position Y High Byte				Y offset position, signed 16-bit. Full scale range of +/-10m, resulting in resolution of about 0.0003 meters. Burst write to all offset registers to set new offset.	
0x13	Offset Y_H	R/W										
0x14	Offset H_L	R/W	Offset Position H Low Byte				Offset Position H High Byte				Heading angle offset, signed 16-bit. Full scale range of +/- 180 deg, resulting in resolution of about 0.0055 deg. Burst write to all offset registers to set new offset.	
0x15	Offset H_H	R/W										
...	Reserved		Reserved									Reserved for potential future use
0x1F	Status	R	Error LSM	Error PAA	Reserved				Warning Optical Tracking	Warning Tilt Angle	Status flags for errors and warnings: Warning Tilt Angle - Max tilt angle exceeded, accelerometer data ignored while set Warning Optical Tracking - Unreliable optical data detected, uses only IMU while set Error PAA - A critical error has been detected with the PAA5160 Error LSM - A critical error has been detected with the LSM6DSO	
0x20	Position X_L	R/W	Position X Low Byte				Position X High Byte				X position, signed 16-bit. Full scale range of +/-10 meters, resulting in resolution of about 0.0003 meters. Burst write to all position registers to track from new location.	
0x21	Position X_H	R/W										
0x22	Position Y_L	R/W	Position Y Low Byte				Position Y High Byte				Y position, signed 16-bit. Full scale range of +/-10 meters, resulting in resolution of about 0.0003 meters. Burst write to all position registers to track from new location.	
0x23	Position Y_H	R/W										
0x24	Position H_L	R/W	Position H Low Byte				Position H High Byte				Heading angle, signed 16-bit. Full scale range of +/- 180 degrees, resulting in resolution of about 0.0055 degrees. Burst write to all position registers to track from new location.	
0x25	Position H_H	R/W										
0x26	Velocity X_L	R	Velocity X Low Byte				Velocity X High Byte				X velocity, signed 16-bit. Full scale range of +/-5 m/sec, resulting in resolution of about 0.00015 m/sec.	
0x27	Velocity X_H	R										
0x28	Velocity Y_L	R	Velocity Y Low Byte				Velocity Y High Byte				Y velocity, signed 16-bit. Full scale range of +/-5 m/sec, resulting in resolution of about 0.00015 m/sec.	
0x29	Velocity Y_H	R										
0x2A	Velocity H_L	R	Velocity H Low Byte				Velocity H High Byte				Heading velocity, signed 16-bit. Full scale range of +/- 2000 deg/sec, resulting in resolution of about 0.061 deg/sec.	
0x2B	Velocity H_H	R										
0x2C	Acceleration X_L	R	Acceleration X Low Byte				Acceleration X High Byte				X acceleration, signed 16-bit. Full scale range of +/-157 m/sec^2 (16 g), resulting in resolution of about 0.0048 m/sec^2 (0.00049 g).	
0x2D	Acceleration X_H	R										
0x2E	Acceleration Y_L	R	Acceleration Y Low Byte				Acceleration Y High Byte				Y acceleration, signed 16-bit. Full scale range of +/-157 m/sec^2 (16 g), resulting in resolution of about 0.0048 m/sec^2 (0.00049 g).	
0x2F	Acceleration Y_H	R										
0x30	Acceleration H_L	R	Acceleration H Low Byte				Acceleration H High Byte				Heading acceleration, signed 16-bit. Full scale range of +/- 180000 deg/sec^2, resulting in resolution of about 5.5 deg/sec^2.	
0x31	Acceleration H_H	R										
0x32	Position StdDev X_L	R	Position Standard Deviation X Low Byte				Position Standard Deviation X High Byte				X position, signed 16-bit. Full scale range of +/-10 meters, resulting in resolution of about 0.0003 meters. Write to all position registers to track from new location.	
0x33	Position StdDev X_H	R										
0x34	Position StdDev Y_L	R	Position Standard Deviation Y Low Byte				Position Standard Deviation Y High Byte				Y position, signed 16-bit. Full scale range of +/-10 meters, resulting in resolution of about 0.0003 meters. Write to all position registers to track from new location.	
0x35	Position StdDev Y_H	R										
0x36	Position StdDev H_L	R	Position Standard Deviation H Low Byte				Position Standard Deviation H High Byte				Heading angle, signed 16-bit. Full scale range of +/- 180 degrees, resulting in resolution of about 0.0055 degrees. Write to all position registers to track from new location.	
0x37	Position StdDev H_H	R										
0x38	Velocity StdDev X_L	R	Velocity Standard Deviation X Low Byte				Velocity Standard Deviation X High Byte				X velocity, signed 16-bit. Full scale range of +/-5 m/sec, resulting in resolution of about 0.00015 m/sec.	
0x39	Velocity StdDev X_H	R										
0x3A	Velocity StdDev Y_L	R	Velocity Standard Deviation Y Low Byte				Velocity Standard Deviation Y High Byte				Y velocity, signed 16-bit. Full scale range of +/-5 m/sec, resulting in resolution of about 0.00015 m/sec.	
0x3B	Velocity StdDev Y_H	R										
0x3C	Velocity StdDev H_L	R	Velocity Standard Deviation H Low Byte				Velocity Standard Deviation H High Byte				Heading velocity, signed 16-bit. Full scale range of +/- 2000 deg/sec, resulting in resolution of about 0.061 deg/sec.	
0x3D	Velocity StdDev H_H	R										
0x3E	Acceleration StdDev X_L	R	Acceleration Standard Deviation X Low Byte				Acceleration Standard Deviation X High Byte				X acceleration, signed 16-bit. Full scale range of +/-157 m/sec^2 (16 g), resulting in resolution of about 0.0048 m/sec^2 (0.00049 g).	
0x3F	Acceleration StdDev X_H	R										
0x40	Acceleration StdDev Y_L	R	Acceleration Standard Deviation Y Low Byte				Acceleration Standard Deviation Y High Byte				Y acceleration, signed 16-bit. Full scale range of +/-157 m/sec^2 (16 g), resulting in resolution of about 0.0048 m/sec^2 (0.00049 g).	
0x41	Acceleration StdDev Y_H	R										
0x42	Acceleration StdDev H_L	R	Acceleration Standard Deviation H Low Byte				Acceleration Standard Deviation H High Byte				Heading acceleration, signed 16-bit. Full scale range of +/- 180000 deg/sec^2, resulting in resolution of about 5.5 deg/sec^2.	
0x43	Acceleration StdDev H_H	R										
0x44	LSM6DSO OUTX_L_G	R	OUTX_L_G				Latest data from LSM6DSO burst read, see datasheet for details					
0x45	LSM6DSO OUTX_H_G	R	OUTX_H_G									
0x46	LSM6DSO OUTY_L_G	R	OUTY_L_G									
0x47	LSM6DSO OUTY_H_G	R	OUTY_H_G									
0x48	LSM6DSO OUTZ_L_G	R	OUTZ_L_G									
0x49	LSM6DSO OUTZ_H_G	R	OUTZ_H_G									
0x4A	LSM6DSO OUTX_L_A	R	OUTX_L_A									
0x4B	LSM6DSO OUTX_H_A	R	OUTX_H_A									
0x4C	LSM6DSO OUTY_L_A	R	OUTY_L_A									
0x4D	LSM6DSO OUTY_H_A	R	OUTY_H_A									
0x4E	LSM6DSO OUTZ_L_A	R	OUTZ_L_A									
0x4F	LSM6DSO OUTZ_H_A	R	OUTZ_H_A									
0x50	PAA5160 Burst Data 0	R	Burst Data Byte 0				Latest data from PAA5160 burst read, these are not documented					
0x51	PAA5160 Burst Data 1	R	Burst Data Byte 1									
0x52	PAA5160 Burst Data 2	R	Burst Data Byte 2									
0x53	PAA5160 Burst Data 3	R	Burst Data Byte 3									
0x54	PAA5160 Burst Data 4	R	Burst Data Byte 4									
0x55	PAA5160 Burst Data 5	R	Burst Data Byte 5									
0x56	PAA5160 Burst Data 6	R	Burst Data Byte 6									
0x57	PAA5160 Burst Data 7	R	Burst Data Byte 7									
0x58	PAA5160 Burst Data 8	R	Burst Data Byte 8									
0x59	PAA5160 Burst Data 9	R	Burst Data Byte 9									
0x5A	PAA5160 Burst Data 10	R	Burst Data Byte 10									
0x5B	PAA5160 Burst Data 11	R	Burst Data Byte 11									
...	Reserved		Reserved								Reserved for potential future use	