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# Sensor-to-Vehicle Frame Transformation Direction Cosine Matrix (0x0C,0x33)

Description	Set the sensor to vehicle frame transformation using a using a 3 x 3 direction cosine matrix , stored in row-major order in a 9-element array.
Notes	<p>These angles define the transformation of vectors from the sensor body frame to the fixed vehicle frame, according to:</p> <p>Where:</p> <p>is a 3-element vector expressed in the sensor body frame.</p> <p>is the same 3-element vector expressed in the vehicle frame.</p> <p>The matrix elements are stored is row-major order:</p> <p>The transformation may be stored in the device as a matrix or a quaternion. When is read back from the device, it may not be exactly equal to array used to set the transformation, but it is functionally equivalent.</p> <p>This transformation affects the following output quantities:</p> <p>IMU:</p> <p>Scaled Acceleration</p> <p>Scaled Gyro</p> <p>Scaled Magnetometer</p> <p>Delta Theta</p> <p>Delta Velocity</p> <p>Estimation Filter:</p>

	Estimated Orientation, Quaternion Estimated Orientation, Matrix Estimated Orientation, Euler Angles Estimated Linear Acceleration Estimated Angular Rate Estimated Gravity Vector  Changing this setting will force all low-pass filters, the complementary filter, and the estimation filter to reset.	
Parameter Name	Data Type	Description
<i>Field Length</i>	<i>u8</i>	3
<i>Descriptor</i>	<i>u8</i>	0x33
Function Selector	u8	This command supports the following MIP function selectors: Write Read Save Load Default [WRSLD]
Dcm [W]	<a href="#">Matrix3f</a>	3 x 3 direction cosine matrix, stored in row-major order
Ack/Nack Reply	<a href="#">See standard MIP ack/nack reply format.</a>	
Response Data	Data Type	Description
<i>Response Length</i>	<i>u8</i>	2
<i>Response Descriptor</i>	<i>u8</i>	0xB3
Dcm	<a href="#">Matrix3f</a>	3 x 3 direction cosine matrix, stored in row-major order