MICROCONTROL INC
REALTIME SYSTEMS
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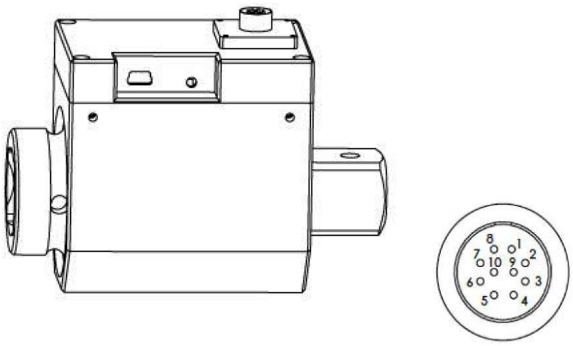
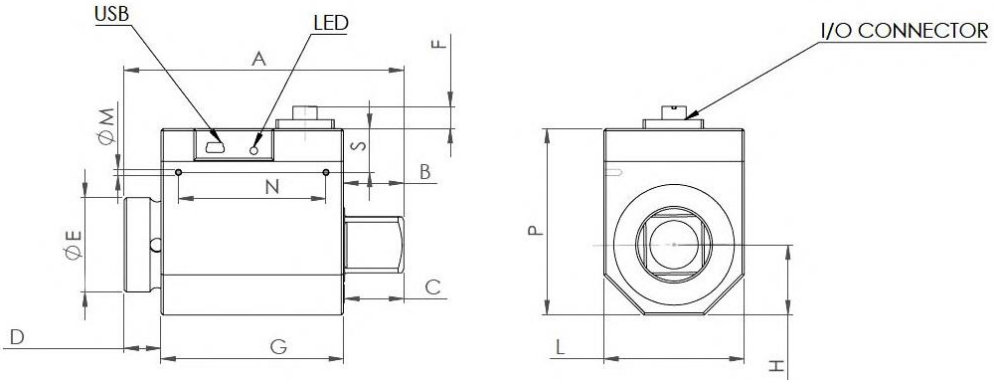
iTAC

Intelligent Torque Angle Contactless Transducer



I/O CONNECTOR			
PIN1	ANALOG OUT CH 2	PIN6	ANGLE A OUT
PIN2	ANALOG OUT CH1	PIN7	ID
PIN3	IN 1	PIN8	GND
PIN4	OUT 1	PIN9	SHUNT ENABLE
PIN5	ANGLE B OUT	PIN10	+5 VOLT SUPPLY



USB	
PIN1	+5V
PIN2	DATA-
PIN3	DATA+
PIN4	GND

Nominal Torque N.M	SQUARE DRIVE	A	B	C	D	E	F	G	H	L	M	N	P	S
2/10/20	1/4"	98.87	8.00	7.30	10.37	15.00	14.80	80.50	21.50	43.00	M4	64.50	63	21.00
50	3/8”	107.60	11.50	11.00	15.60	24.00	14.80	80.50	21.50	43.00	M4	64.50	63	21.00
100/160/200	1/2”	116.00	15.50	15.00	15.60	24.00	14.80	80.50	21.50	43.00	M4	64.50	63	21.00
500	3/4"	117.00	23.00	22.50	15.90	34.00	14.80	81.50	26.50	53.00	M4	67.50	72	24.00
1000	1”	127.60	27.50	27.00	16.80	43.00	14.80	83.30	32.00	64.00	M4	67.30	85	20.00

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Specifications

USB Data	
Ch1 Full Scale Torque Value	12 Bit Digital
Ch2 Torque Value x 3 (Maximum 1/3 of Full Scale)	12 Bit Digital
Angle CW and CCW	32 Bit Digital
Sample Rate	4000 Sample/Sec

ELECTRICAL VALUES I/O Connector	
Rated Supply Voltage Range (pin 10)	4.5-7 VDC
Power consumption	<1 W
Output Voltage at Full Scale Torque (CH1 pin 2)	± 4.5 V
Output Voltage at 1/3 Full Scale Torque (CH2 pin 1)	± 4.5 V
Output Impedance	1 K Ohm
Voltage output for rated torque Ch1: (pin 2)	4.5 Volts, Shunt output 1.60 VDC
Voltage output for 1/3 of rated torque Ch2: (pin 1)	4.5 Volt, Shunt output 4.50 VDC
Shunt Enable: (pin 9)	5 V DC
Digital Input : (pin 3)	5 V DC
Digital Output: (pin 4)	5 V DC
Angle A Output: (pin 6)	CW Lead
Angle B Output: (pin 5)	CW Trail
ID and Sensor Calibration Data: (pin 7)	I/O 5 Volt
Angle Measurement Optical Encoder	
Output with external circuit	Quadrature Open Collector
Pull-up resistor at user side	2 K Ohm to 5 V level
Resolution for encoder disk with 720 increments 3/4",1",1.5" Drive	0.125 Degree
Resolution for encoder disk with 360 increments 1/4", 3/8", 1/2" Drive	0.250 Degree

Environmental Condition	
Operating temperature range	(0-60)^{o} C
Rated temperature range	(0-60)^{o} C

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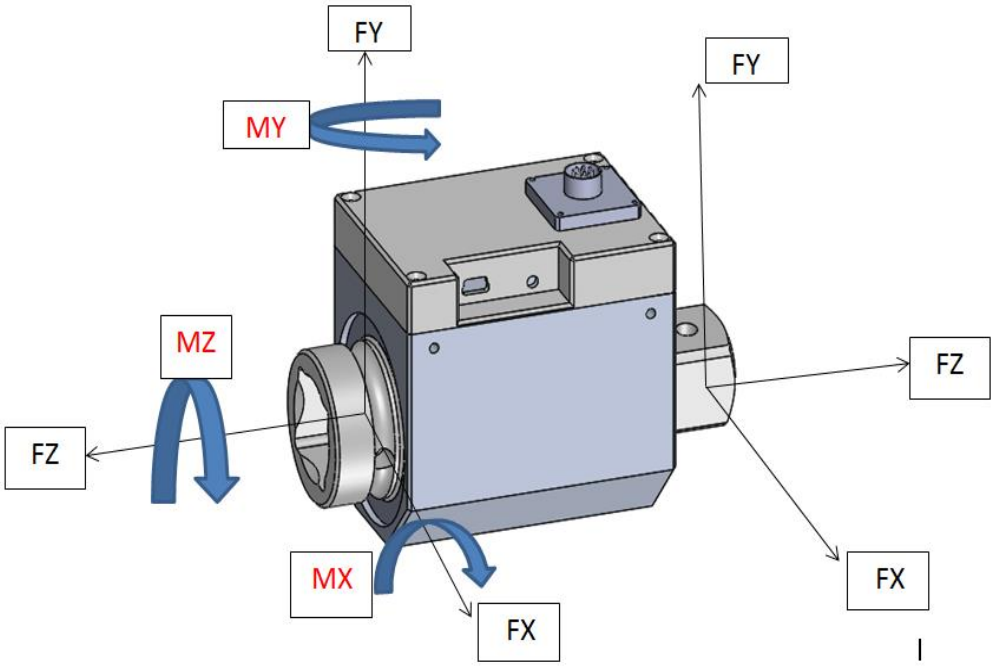
Mechanical Values	
Relative linearity deviation (standard sensor)	(0-2000) N.M
Measuring range	< ± 0.2 % F.S.
Non-Linearity (dual range sensor)	< ± 0.2 % F.S.
Hysteresis	< ± 0.2 % F.S.
Max. Operating torque (standard sensor)	150 % of rated torque

Electrical connections	
I/O Connector	Hirose HR10A-10R-10SB(71)
I/O Mating Connector	Hirose HR10A-10P-10P(73)
USB	Mini USB Plug Connector
Fixing Method	Mounting holes are located on the side or base

Guide to Calculating Extraneous Loads

Micro Control Inc provides reliable data that helps the customers in determining the right product for their application. We provide this “Extraneous Loads & Coefficients Guide” in order to help the customers to determine the adequacy of the sensor in the presence of loads and moments that are not in the intended direction of the sensor.



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Loads (Fx, Fy, Fz [N])

Defined as a load along each respective axis, these forces are applied by the customer during or after installation. The direction of each load is indicated on the specification sheet of each load cell model.

Moments (Mx, My, Mz [N-M]).

Moments (torques) are forces that cause the structure to either bend or rotate label the axes correctly on each of iTAC sensors, please refer to the Data Sheet of the Contactless torque Sensors. Using this information, Micro Control utilizes a combined stress equation to determine whether or not a sensor is suitable for the application.

CALCULATING THE EXTERNAL LOADS

There are four easy steps in determining if the external loads are acceptable on the load cell:

1. Determine the extraneous forces and moments that will be acting on the sensor

2. Select the extraneous load coefficients provided by the table for the sensor's capacity

3. Lastly solve the basic equation for the combined stress due to all the loads from step

4. The calculated combined stress should be equal to or less that the chosen $\sigma(Max)$ from step 3. If you exceed

The allowable stress value, a higher capacity model should be chosen. The basic equation for combined stress is the following:

$$\sigma(Max) \geq (A)|FX| + (B)|FY| + (C)|FZ| + (D)|MX| + (E)|MY| + (F)|MZ|$$

A, B, C, D, E, F are the coefficients (step 3) determined by Micro Control Inc. The units of A, B and C are provided in m^2, whereas the units of D, E, and F are provided in m. The resulting answer from the equation above has units of N/M^2.

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PART NUMBER	CAPACITY	EXTRANOUS LOAD COEFFICIENT				SPRING RATE	MAX RPM
		A&B	C	D&E	F		
iTAC025-00002NM	2						10000
iTAC025-00020NM	20	6.9E+05	2.4E+04	1.06E+07	7.3E+07	5.4E+06	10000
iTAC037-00050NM	50	5.1E+05	7.2E+03	4.1E+06	6.2E+06	2.5E+03	9000
iTAC050-00100NM	100	4.6E+05	9.1E+03	3.8E+06	5.4E+06	3.6E+03	9000
iTAC050-00160NM	160	2.4E+05	5.7E+03	2.4E+06	2.7E+06	5.2+E03	9000
iTAC050-00200NM	200	13.7+E05	3.5+E05	1.8E+06	1.33E+06	2.4+E04	9000
iTAC075-00500NM	500	9.16+E04	4+E03	4.5+E05	5.3+E05	3.9+E04	7000
iTAC100-01000NM	1000	7.3+E03	2.1+E03	3.6E+03	4.8E+03	1.1+E05	7000

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