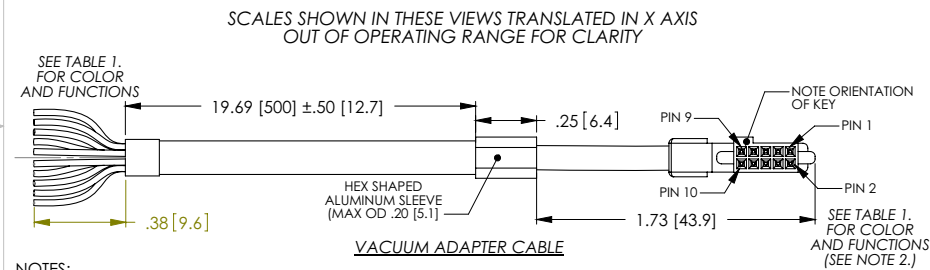
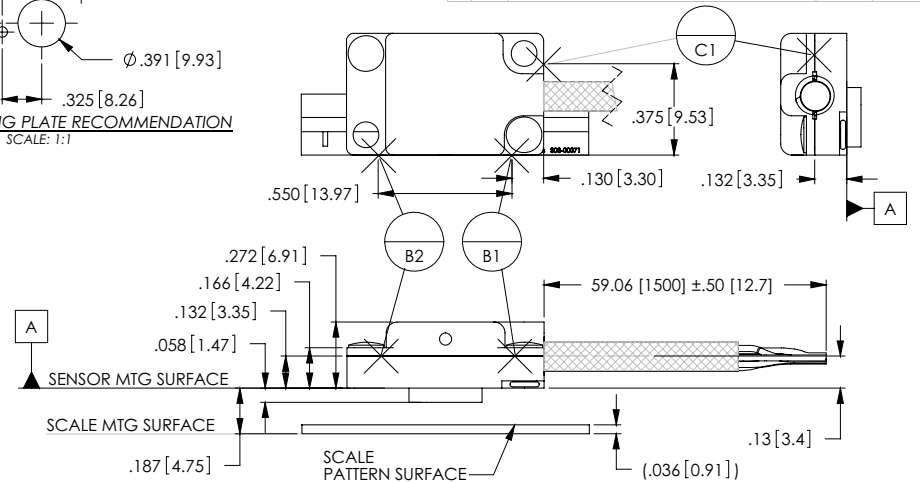
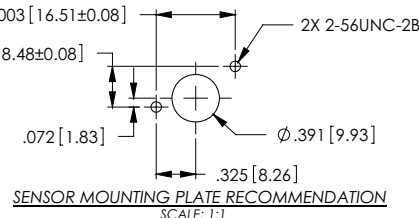
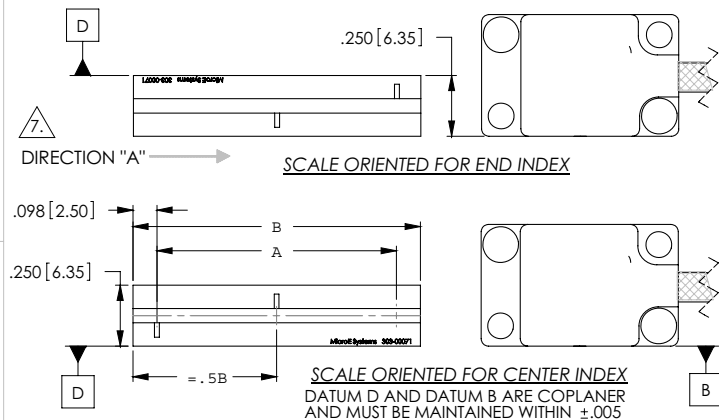


# Mercury 2000V, 3000V Encoder System Interface Drawing: Short Linear Scales

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- NOTES:**
- RECOMMENDED MOUNTING HARDWARE:  
2-56 OR M2 SCREWS w/ 4 FLAT WASHERS (2 ON EACH SCREW)  
(OD OF WASHER NOT TO EXCEED .150 [3.81])
  - THIS CONNECTOR (FCI p/n 87012-605 or SAMTEC p/n SFM-105-03-S-D) IS INSIDE THE SMARTPRECISION ELECTRONICS ENCLOSURE (see interface drawings).
  - IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED ALONG DATUM EDGES OF BOTH THE SENSOR AND THE SCALE FOR PROPER ALIGNMENT. (REFERENCE DATUMS B1, B2 AND C1 FOR SENSOR BENCHING PINS).
  - HEIGHT OF SENSOR BENCHING PINS MUST BE A MINIMUM OF .170 [4.32] IN HEIGHT FROM DATUM A.
  - HEIGHT OF SCALE BENCHING PINS NOT TO EXCEED THE THICKNESS OF THE SCALE.
  - RECOMMENDED SENSOR MOUNTING PLATE THICKNESS:  
MINIMUM- 4 SCREW THREADS  
MAXIMUM- ALLOW CLEARANCE FOR SCALE AND SCALE MOUNTING HARDWARE (BENCHING SURFACES, CLAMPS, HUBS, ETC.)

WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY READHEAD, OUTPUT SIGNAL COS+ (BROWN [PIN 5]) LEADS OUTPUT SIGNAL SIN+ (YELLOW [PIN 1]).

**SCALE IDENTIFICATION AND SIZE.**

Scale Identification	Measured Length	Scale Length
LXX	XX mm - 5mm	XX mm
L30	30mm - 5mm = 25mm	30mm
(max) L130	130mm - 5mm = 125mm	130mm

THESE ARE EXAMPLES

**TABLE 1.**

Wire Color	Function	Pin
Yellow	SIN+	1
Green	SIN-	3
Brown	COS+	5
Orange	COS-	7
Blue	INDEX WINDOW -	2
Red	+5V	8
Violet	INDEX WINDOW +	6
Black	GND	4
Gray	N/C	9
White	N/C	10

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES (millimeters) DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994

TOLERANCES ARE:  
DECIMALS: .XX [X]±.01 [25]  
XXX [XX]±.005 [13]

ANGULAR: ±30 MIN.

APPROVALS	DATE
DRAWN: S.BUTURLIA	6/24/02
CHECKED:	
ENGRG: D.GRIMES	7/3/02
MFG ENG: G.ANGELOPOULOS	7/3/02
GA: J.FARNAM	7/3/02

UNITS: .in [mm]

MicroE System Division of GSI

8 Erie Drive Natick, MA 01760

DESCRIPTION: INTERFACE, ENCODER, 200um, SHORT LINEAR, MERCURY 2000/3000 VACUUM SENSOR

SIZE: B DWG. NO.: ID-00237 REV. F

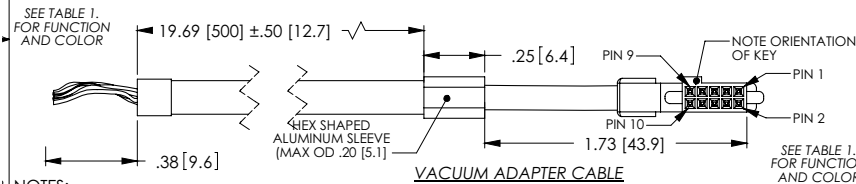
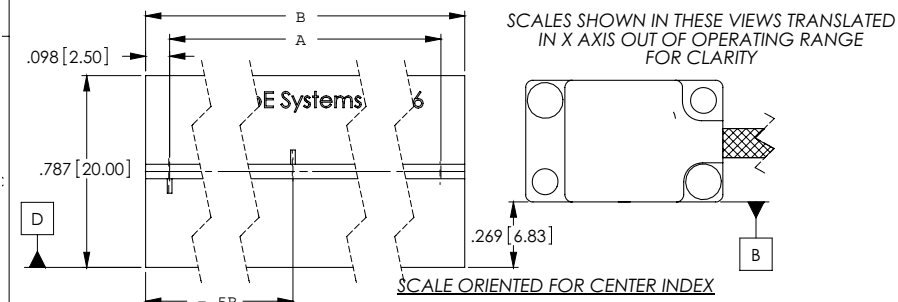
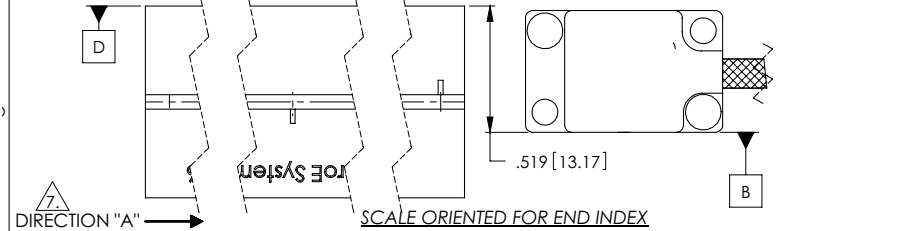
SCALE: 2:1 CAD FILE: SHEET 1 OF 1

LT#	ECO	DESCRIPTION	DATE	APPD
A	---	RELEASE TO PRODUCTION	7/8/02	MF
B	960	SNOUT DIMS REF. SCALE THK WAS .037. REF.	9/24/02	MF
C	1426	UPDATED MODEL WITH SHRUNKEN HYBRID. ADDED NOTE 8.	5/31/05	SB
D	1492	REMOVED NOTE 8.	10/5/05	SB
E	1517	UPDATED NOTE 2. SEE ECO	11/28/05	MF
F	1939	CHANGED CABLE CONNECTOR ON ADAPTER. ADDED HOTMELT.	11/30/07	MF

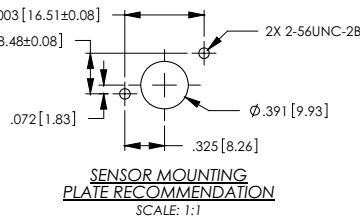
# Mercury 2000V, 3000V Encoder System Interface Drawing: Long Linear Scales

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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPD
A	---	RELEASE TO PRODUCTION	7/8/02	MF
B	960	SNOUT DIMS CHANGED TO REF.	9/24/02	MF
C	1426	MODEL UPDATED WITH SHRUNKEN HYBRID, ADDED NOTE 8.	5/25/05	SB
D	1492	REMOVED NOTE 8.	10/25/05	SB
E	1517	UPDATED NOTE 2. SEE ECO	11/23/05	MF
F	1939	CHANGED ADAPTER CABLE CONNECTOR. ADDED HOTMELT.	11/30/07	MF



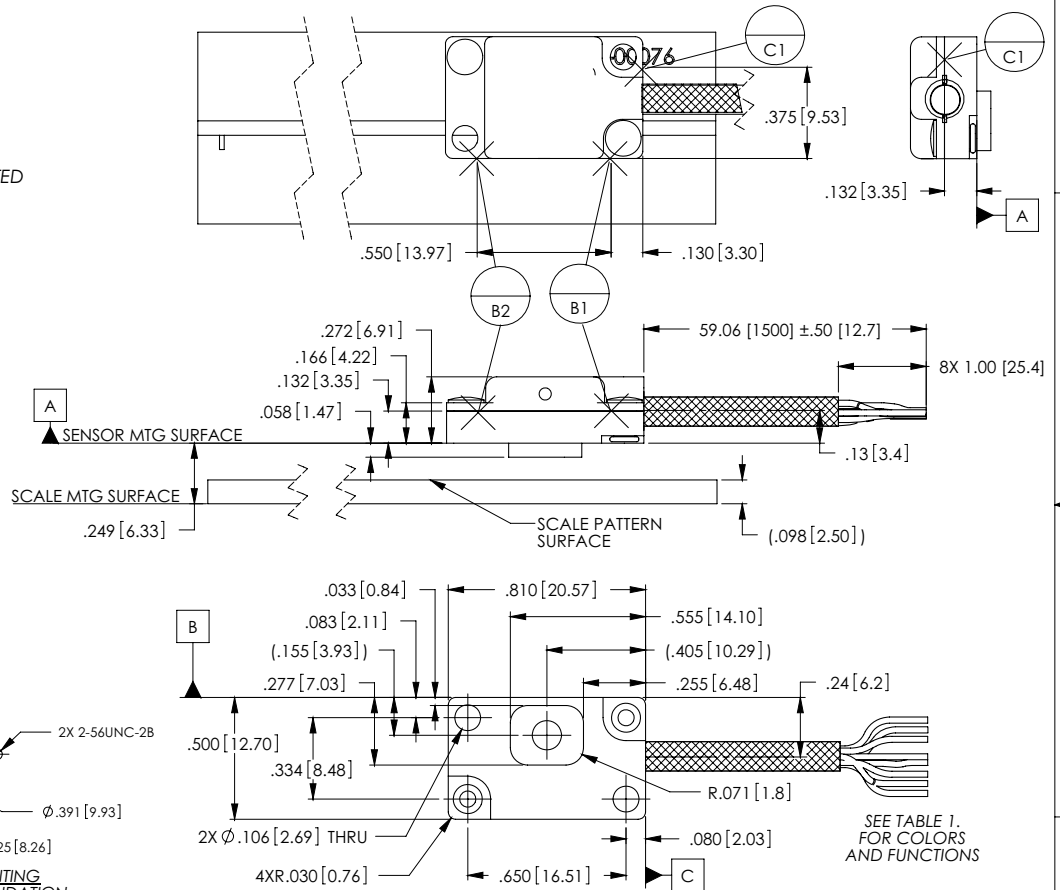
- NOTES:**
- RECOMMENDED MOUNTING HARDWARE:  
2-56 OR M2 SCREWS w/ 4 FLAT WASHERS (2 ON EACH SCREW)  
(OD OF WASHER NOT TO EXCEED .150 [3.81])
  - THIS CONNECTOR (FCI p/n 87012-605 or SAMTEC p/n SFM-105-03-S-D) IS INSIDE THE SMARTPRECISION ELECTRONICS ENCLOSURE (see Interface drawings).
  - IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED ALONG DATUM EDGES OF BOTH THE SENSOR AND THE SCALE FOR PROPER ALIGNMENT. (REFERENCE DATUMS B1, B2 AND C1 FOR SENSOR BENCHING PINS).
  - HEIGHT OF SENSOR BENCHING PINS MUST BE A MINIMUM OF .170 [4.32] IN HEIGHT FROM DATUM A.
  - HEIGHT OF SCALE BENCHING PINS NOT TO EXCEED THE THICKNESS OF THE SCALE.
  - RECOMMENDED SENSOR MOUNTING PLATE THICKNESS:  
MINIMUM- 4 SCREW THREADS  
MAXIMUM- ALLOW CLEARANCE FOR SCALE AND SCALE MOUNTING HARDWARE (BENCHING SURFACES, CLAMPS, HUBS, ETC.)



### SCALE IDENTIFICATION AND SIZE.

Scale	Dim A.	Dim B.
LXX	XX mm - 5mm	XX mm
L155	155mm - 5mm = 150mm	155mm
(max) L2025	2025mm - 5mm = 2020mm	2025mm

THESE ARE EXAMPLES



**TABLE 1.**

Wire Color	Function	Pin
Yellow	SIN+	1
Green	SIN-	3
Brown	COS+	5
Orange	COS-	7
Blue	INDEX WINDOW -	2
Red	+5V	8
Violet	INDEX WINDOW +	6
Black	GND	4
Gray	N/C	9
White	N/C	10

UNLESS OTHERWISE SPECIFIED  
ALL DIMENSIONS ARE IN INCHES (millimeters)  
DIM. APPLY AFTER PROCESSING  
INTERPRET ALL GEOMETRIC TOOLS.  
PER ANSI Y14.5M-1994

TOLERANCES ARE:  
DECIMALS: XX [X]±.01 [25]  
XXX [X]±.005 [13]

APPROVALS	DATE
DRAWN: S.BUTURLIA	6/24/02
CHECKED:	
ENGR: D.GRIMES	7/3/02
DRG ENG: G.ANGELOPOULOS	7/3/02
GA: J.FARNAM	7/3/02

MicroE Systems  
Division of GSI  
8 Erie Drive  
Natick, MA 01760

DESCRIPTION:  
**INTERFACE, ENCODER, 20um,  
LONG LINEAR, MERCURY  
2000/3000 VACUUM SENSOR**

SEE DWG. NO. ID-00238  
SCALE: 2:1 CAD FILE: SHEET 1 OF 1

7. WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY READHEAD, OUTPUT SIGNAL COS+ (BROWN [PIN 5]) LEADS OUTPUT SIGNAL SIN+ (YELLOW [PIN 1]).

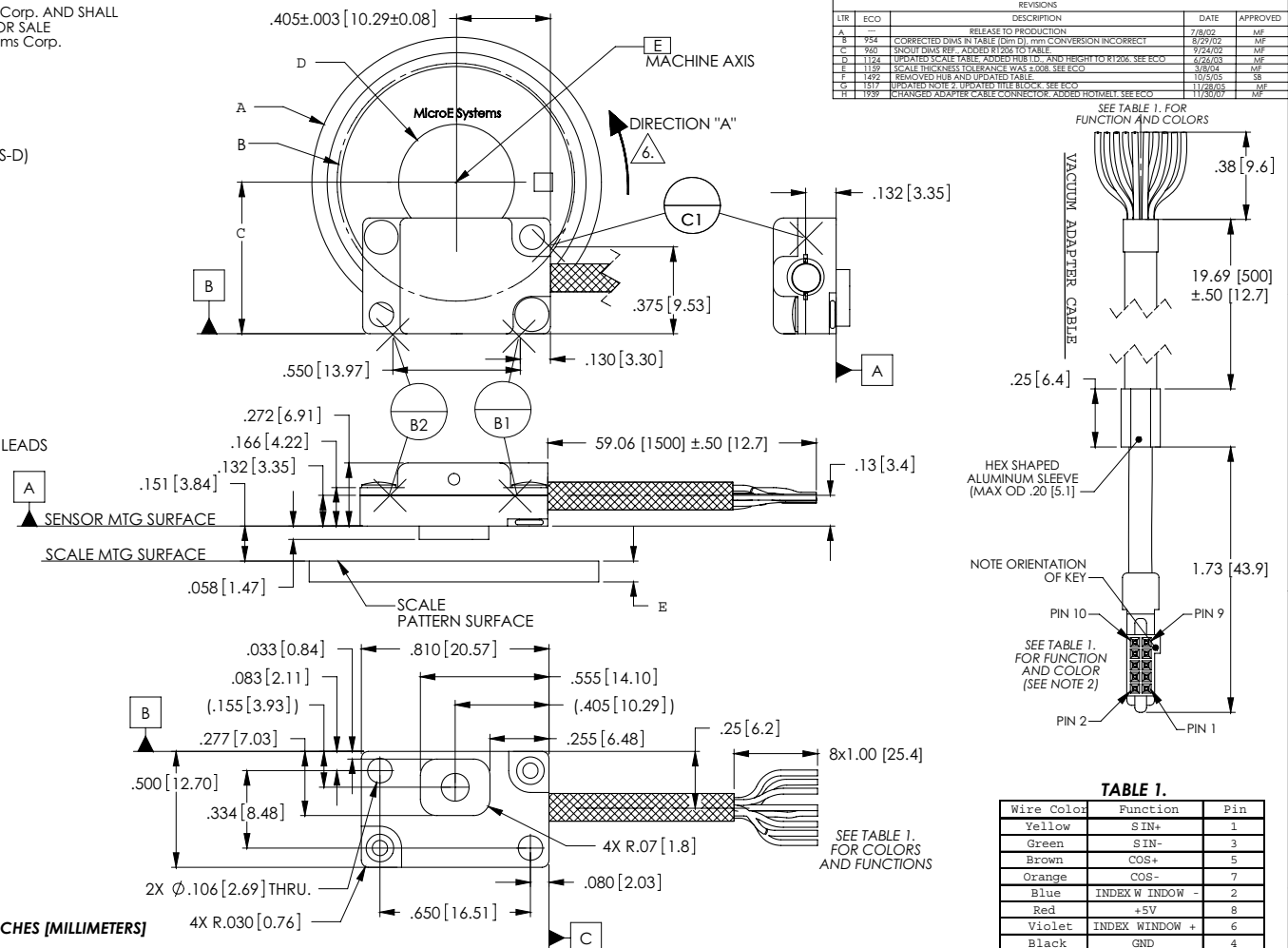
# Mercury 2000V, 3000V Encoder System Interface Drawing: Rotary Scales with Hub

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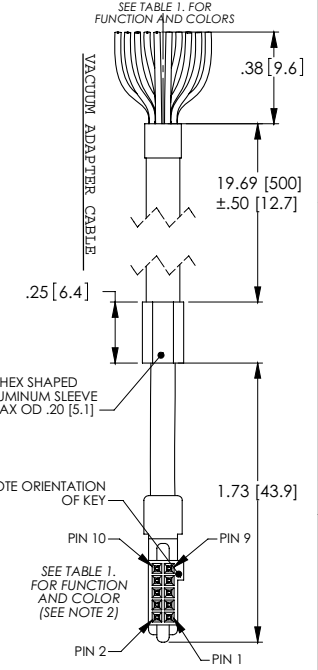
**NOTE:**

1. RECOMMENDED MOUNTING HARDWARE:  
2-56 OR M2 SCREWS w/ 4 FLAT WASHERS (2 ON EACH SCREW)  
(OD OF WASHER NOT TO EXCEED .150 [3.81])
2. THIS CONNECTOR (FCI p/n 87012-605 or SAMTEC p/n SFM-105-03-S-D)  
IS INSIDE THE SMARTPRECISION ELECTRONICS ENCLOSURE  
(see Interface drawings).
3. IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED  
ALONG DATUM EDGES OF SENSOR FOR PROPER ALIGNMENT.  
(REFERENCE DATUMS B1, B2 AND C1).
4. HEIGHT OF SENSOR BENCHING PINS MUST BE A MINIMUM  
OF .170 [4.32] IN HEIGHT FROM DATUM A.
5. RECOMMENDED SENSOR MOUNTING PLATE THICKNESS:  
MINIMUM- 4 SCREW THREADS  
MAXIMUM- ALLOW CLEARANCE FOR SCALE AND SCALE  
MOUNTING HARDWARE (BENCHING SURFACES, CLAMPS,  
HUBS, ETC.)

△ WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A  
STATIONARY READHEAD, OUTPUT SIGNAL COS+ (BROWN [PIN 5]) LEADS  
OUTPUT SIGNAL SIN+ (YELLOW [PIN 1]).

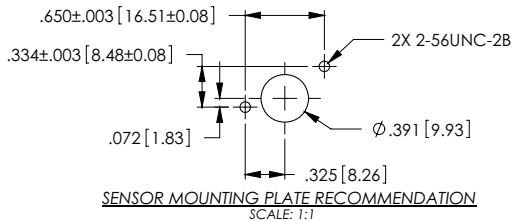


REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
A	---	RELEASE TO PRODUCTION	7/8/02	MF
B	954	CORRECTED DIMS IN TABLE (Dim D), mm CONVERSION INCORRECT	8/29/02	MF
C	962	SKETCH DIMS REF. ADDED TO DIM TABLE	9/24/02	MF
D	1124	UPDATED SCALE TABLE, ADDED HUB I.D., AND HEIGHT TO R1206. SEE ECO	6/24/03	MF
E	1159	SCALE THICKNESS TOLERANCE WAS 2.008. SEE ECO	8/8/04	MF
F	1492	REVISED HUB AND UPDATED TABLE	10/25/05	SB
G	1817	UPDATED NOTE 5, UPDATED THE BLOCK. SEE ECO	11/28/05	MF
H	1929	EXCHANGED ADAPTER CABLE CONNECTOR. ADDED TO SHEET. SEE ECO	11/28/07	MF



**TABLE 1.**

Wire Color	Function	Pin
Yellow	SIN+	1
Green	SIN-	3
Brown	COS+	5
Orange	COS-	7
Blue	INDEX WINDOW -	2
Red	+5V	8
Violet	INDEX WINDOW +	6
Black	GND	4
Gray	N/C	9
White	N/C	10



**SCALE SIZE AND MOUNTING OPTIONS. DIMENSIONS IN INCHES [MILLIMETERS]**

Scale Identification	Counts/Rev	Dim. A Scale O.D.	Dim. B Optia Dia	Dim. C Mounting Dim.	Dim. D Scale I.D.	Dim. E Scale Thickness
R1206	1,650	0.472 [12.00]	0.413 [10.50]	0.348+/-0.002 [8.84+/-0.05]	2.250+/-0.005 [6.35+/-0.13]	0.036+/-0.002 [0.91+/-0.05]
R1910	2,500	0.750 [19.05]	0.627 [15.92]	0.454+/-0.002 [11.53+/-0.05]	2.375+/-0.005 [9.53+/-0.13]	0.090+/-0.004 [2.29+/-0.10]
R3213	4,096	1.250 [31.75]	1.027 [26.08]	0.654+/-0.002 [16.62+/-0.05]	2.500+/-0.005 [12.70+/-0.13]	0.090+/-0.004 [2.29+/-0.10]
R5725	8,192	2.250 [57.15]	2.053 [52.15]	1.168+/-0.002 [29.66+/-0.05]	2.100+/-0.005 [25.40+/-0.13]	0.090+/-0.004 [2.29+/-0.10]
R10851	16,384	4.250 [107.95]	4.106 [104.30]	2.194+/-0.002 [55.73+/-0.05]	2.000+/-0.005 [50.80+/-0.13]	0.090+/-0.004 [2.29+/-0.10]

UNLESS OTHERWISE SPECIFIED:  
ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].  
DIM. APPLY AFTER PROCESSING.  
INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994.

TOLERANCES ARE:  
DECIMALS: .XX [X]±0.1 [25] ±30 MIN.  
.XXX [XX]±0.05 [13]

APPROVALS: DRAWN: S.BUTURLIA, CHECKED: [Signature], ENGRG: D.GRIMES, MFG ENG: G.ANGELOPOULOS, GA: J.FARNAM

DATE: 6/24/02, 7/3/02, 7/3/02, 7/3/02

**GS** MicroE Systems  
8 Erie Drive  
Natick, MA 01756

DESCRIPTION: INTERFACE, ENCODER, 20um, ROTARY, MERCURY 2000/3000 VACUUM SENSOR

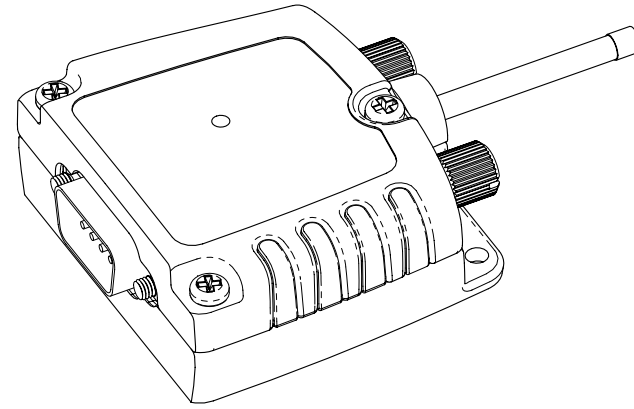
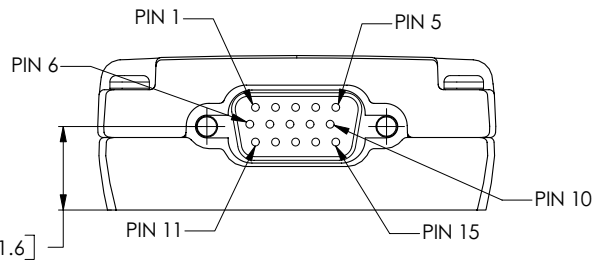
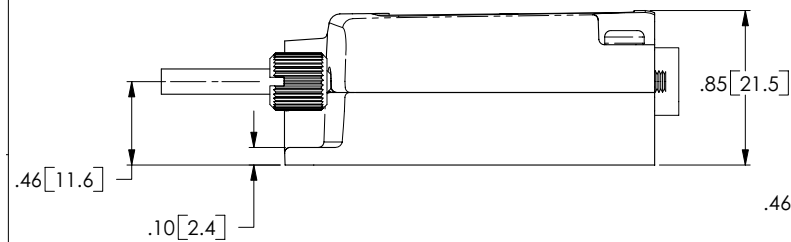
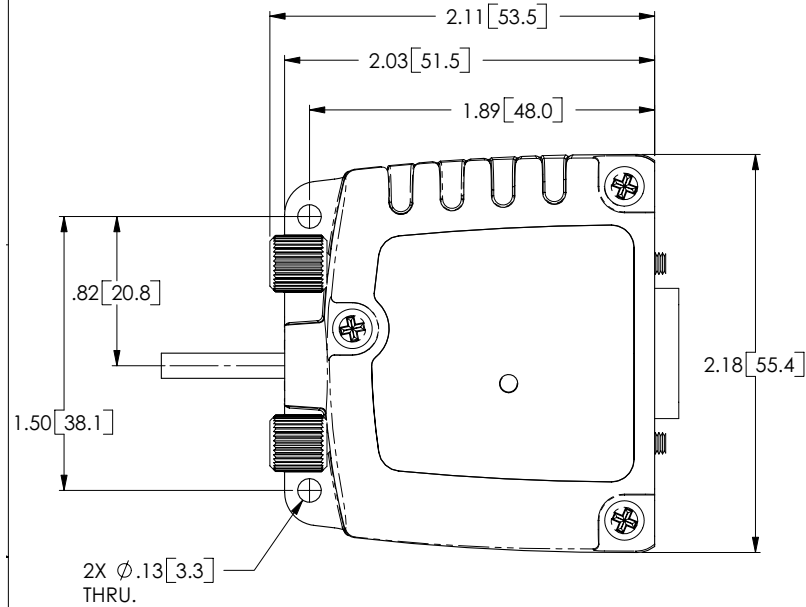
SCALE: 2:1 CAD FILE SHEET 1 OF 1

REV: B	DWG. NO: ID-00239	REV: H
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# Mercury 2000V, 3000V Encoder System

## Interface Drawing: SmartPrecision Electronics Module (Interpolator)

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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
A	—	RELEASE TO PRODUCTION	1/23/02	PD
B	862	UPDATED ENCLOSURE HEIGHT	5/14/02	PD
C	879	CREATED ONE INTERFACE, UPDATED TABLE 1. SEE ECO	6/5/02	MF
D	969	ADDED SS350c TO TABLE, ADDED NOTES PIN 4 AND PIN 10	9/24/02	MF
E	1058	ADDED SS300c TO TABLE, SEE ECO	2/14/03	MF
F	1156	ADDED NOTE 1	9/5/03	SB
G	1317	CHANGED SMARTSIGNAL TO SMARTPRECISION.	11/28/03	MF

TABLE 1.

DB15-HD PINOUTS				
Pin	Functions (SS200c)	Functions (SS300c/SS350c)	Functions (SS300cSI)	Functions (SS350cSI)
1	GND	GND	GND	GND
2	Transmit	Transmit	Transmit	Transmit
3	Receive	Receive	Receive	Receive
4	A-	A-	SDO-	SDO-
5	A+	A+	SDO+	SDO+
6	Reserved	Reserved	Reserved	Reserved
7	Reserved	Reserved	N_CS+	N_CS+
8	Reserved	Reserved	N_CS-	N_CS-
9	B-	B-	Trigger-	SCK_FBK-
10	B+	B+	Trigger+	SCK_FBK+
11	Reserved	Alarm	Alarm	Alarm
12	+5V	+5V	+5V	+5V
13	GND	GND	GND	GND
14	Index+	Index+	SCK+	SCK+
15	Index-	Index-	SCK-	SCK-

NOTES:

1. PIN 1 IS A "RESERVED" PIN THAT SHOULD BE GROUNDED FOR PROPER SYSTEM PERFORMANCE. THE GROUND CONNECTION SHOULD BE MADE TO PIN 13 IN THE MATING CONNECTOR.

UNLESS OTHERWISE SPECIFIED  
ALL DIMENSIONS ARE IN INCHES (millimeters)  
DIM. APPLY AFTER PROCESSING  
INTERPRET ALL GEOMETRIC TOLS.  
PER ANSI Y14.5M-1994  
TOLERANCES ARE:  
DECIMALS: .XX [X] ±0.1 [25]  
.XXX [XX] ±.005 [13]  
ANGULAR: ±30 MIN.

APPROVALS	DATE
DRAWN: PAUL DEVINE	1/10/02
CHECKED:	
ENGRG: PAUL REMILLARD	1/23/02
RFGR ENR: MIKE SKWIRA	1/23/02
GA: JACK FARNAM	1/23/02

UNITS: .in [mm]

MicroE Systems  
Division of GSI  
8 Erie Drive  
Natick, MA 01760

DESCRIPTION:  
**INTERFACE, SMARTPRECISION INTERPOLATOR**

SIB	DWG. NO.	REV
B	ID-00220	G