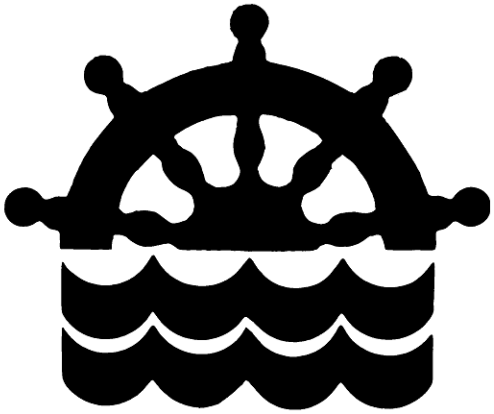
FBE-3
Digital 360 degrees
Rudder feedback

Operation
and
Installation
manual

V.1 May 2003



SCAN-STEERING

CONTENTS

1. A short description.

The FBE-3 rudder feedback is designed to operate with rudders or shuttles up to 360 degree movement.

The FBE-3 is easy to install and calibrate. The feedback is mechanically connected to the rudder by means of a toothed belt, and is adjusted by pressing a button when the rudder is present in 0 deg.

The FBE-3 output is a serial output (RS422) in NMEA183 format. The supply for the system is 24V dc, 0.2A

2. Connection and adjustment.

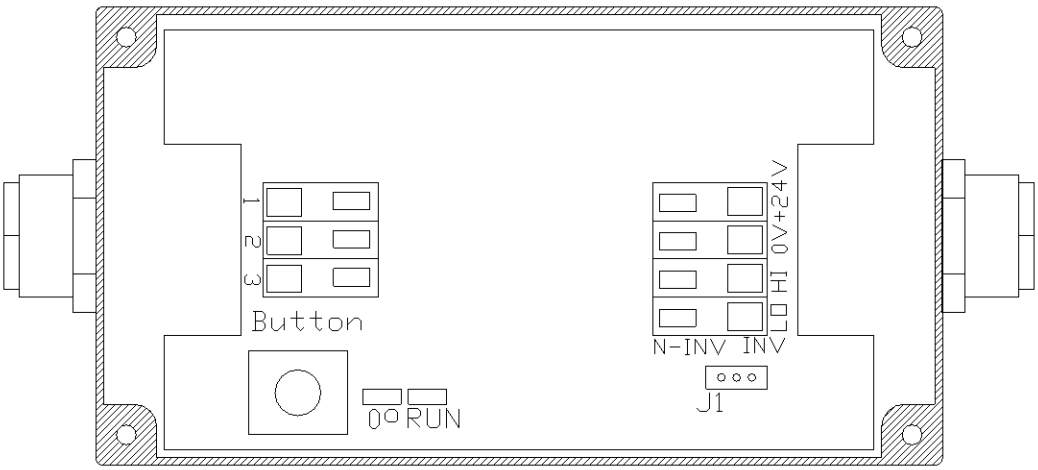


Fig. 2.1

2.1 Connection table

Terminal	Description
24V	+24V main supply
0V	GND main supply
1	Brown wire from Rudder feedback
2	Black wire from Rudder feedback
3	Blue wire form Rudder feedback
HI	High signal for NMEA 183 serial output (RS422)
LO	Low signal for NMEA 183 serial output (RS422)

2.2 Adjustment

Follow the steps below to adjust the FBE-3.

1. Make sure that the rudder feedback is installed as described in Appendix A

2. Turn the rudder mechanically until it has the angle of 0 deg precisely.

3. Press the button, and the adjustment is completed.

4. If the indicator light "0" flashes instead of a constant light, an error has occurred, and the adjustment must be done over again.

When the rudder sensor works correct the "RUN" light will flash slowly. If the light illuminates constant or don't illuminate at all the sensor is not operating correctly, and the power supply must be switched off for 2 seconds and switched on again.

If the direction of the indicated angle is opposite the actual angle, move the jumper "J1" (see fig.2.1) must be moved from the position "N-INV" (left and middle pin) to the position "INV" (middle and right pin).

3. Technical data.

Output serial:	NMEA183, RS422, 4800 baud 8,n,1
NMEA format:	$HEHDT,xxx.x,M[CR][LF]
Power input:	24V dc, 200mA
Belt type:	Polyurethan type XL (order separate)

Appendix A. Feedback mounting

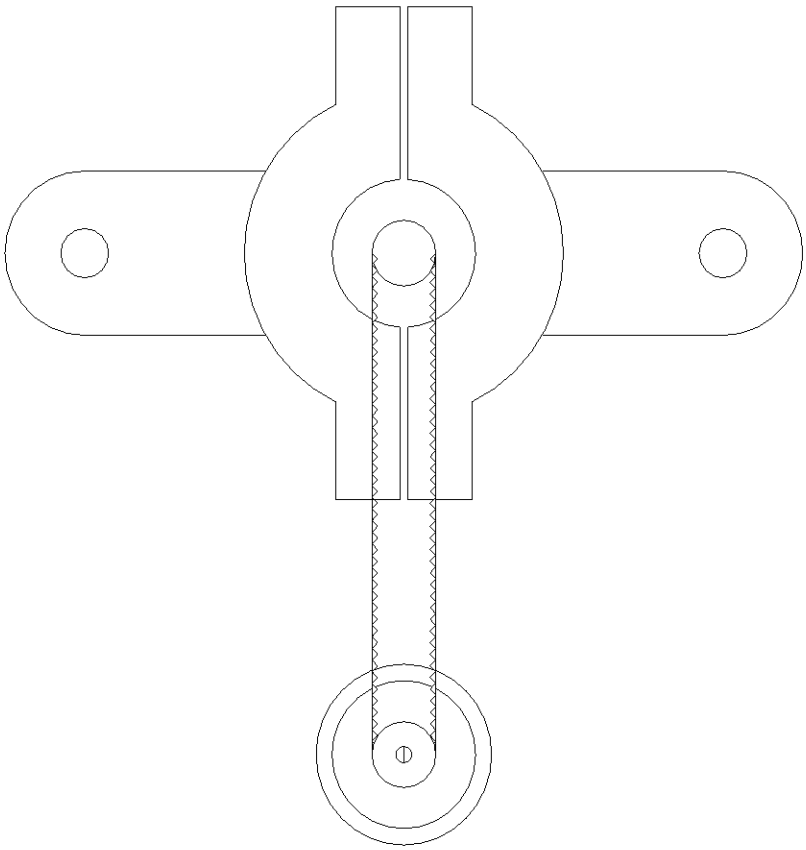


Fig. A.1

The feedback must be installed with a belt (see fig. A.1.).The sprockets must be identical! It is recommended to apply sprockets delivered with the feedback only.
The belt must be mounted in a way that the alignment marks (zero) on the sprocket and on the base of the rudder sensor are aligned. Please refer to appendix D. for details on mechanical adjustment.

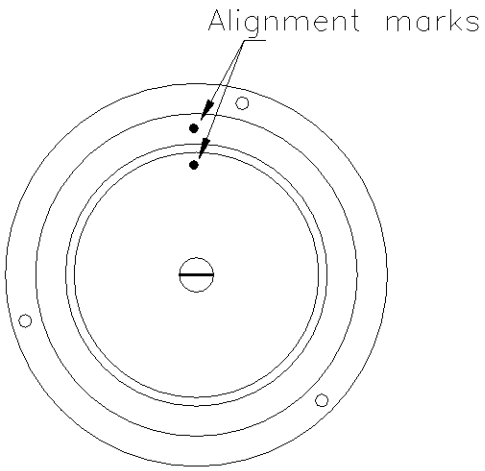


Fig. A.2

Appendix B. Diagram and components

B.1. Diagram

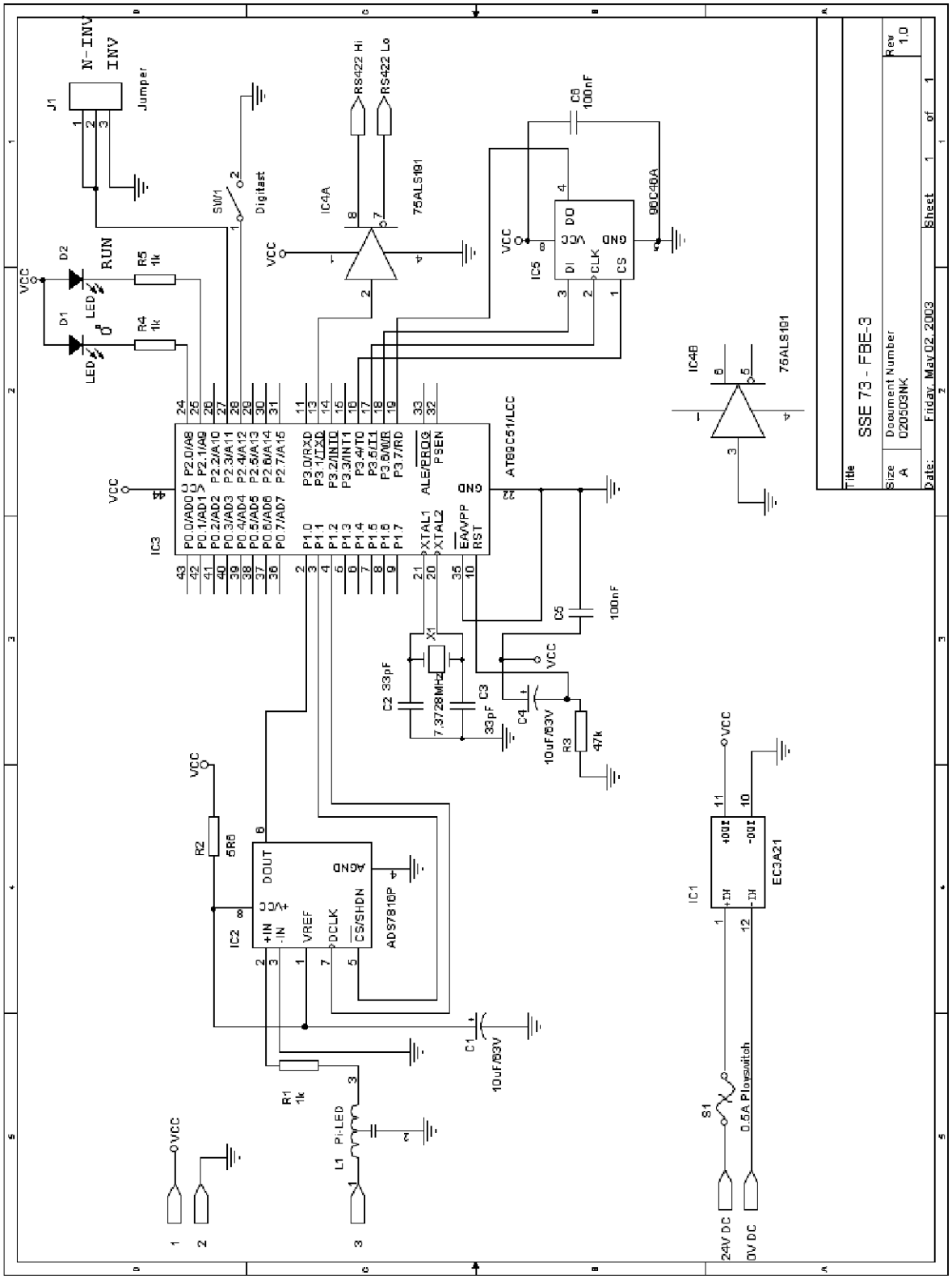


Fig. B.1

B.2. Components.

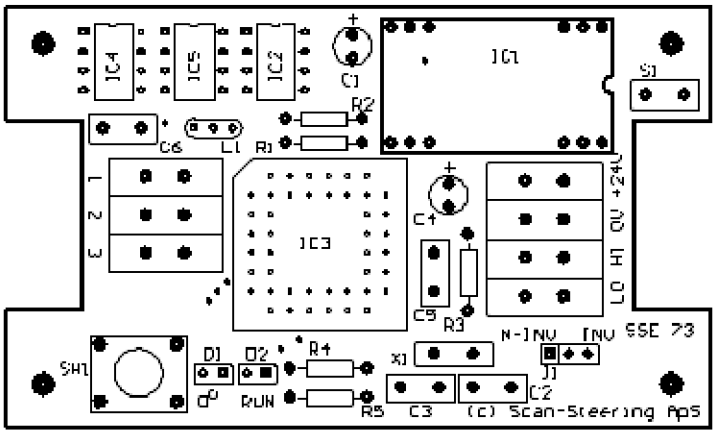


Fig. B.2

Appendix C. Measure reference

REFERENCE	LIMITS		UNIT*
	MIN	MAX	
Terminal +24V	16	28	Vdc
Terminal 1	4.8	5.2	Vdc
Terminal 2	0,0	0,2	Vdc
Terminal 3	0,2	4,8	Vdc

*Measured from GND (0V)

Fig. C.1

Appendix D. Dimensions

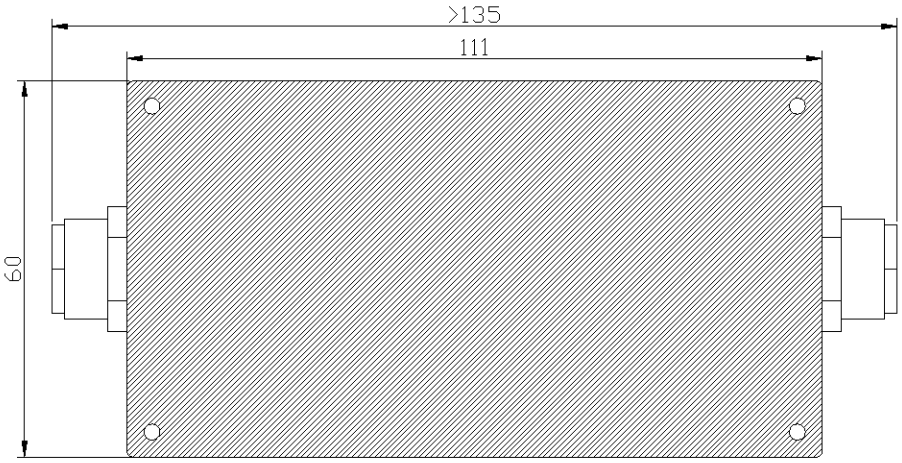


Fig. D.1
Amplifier box

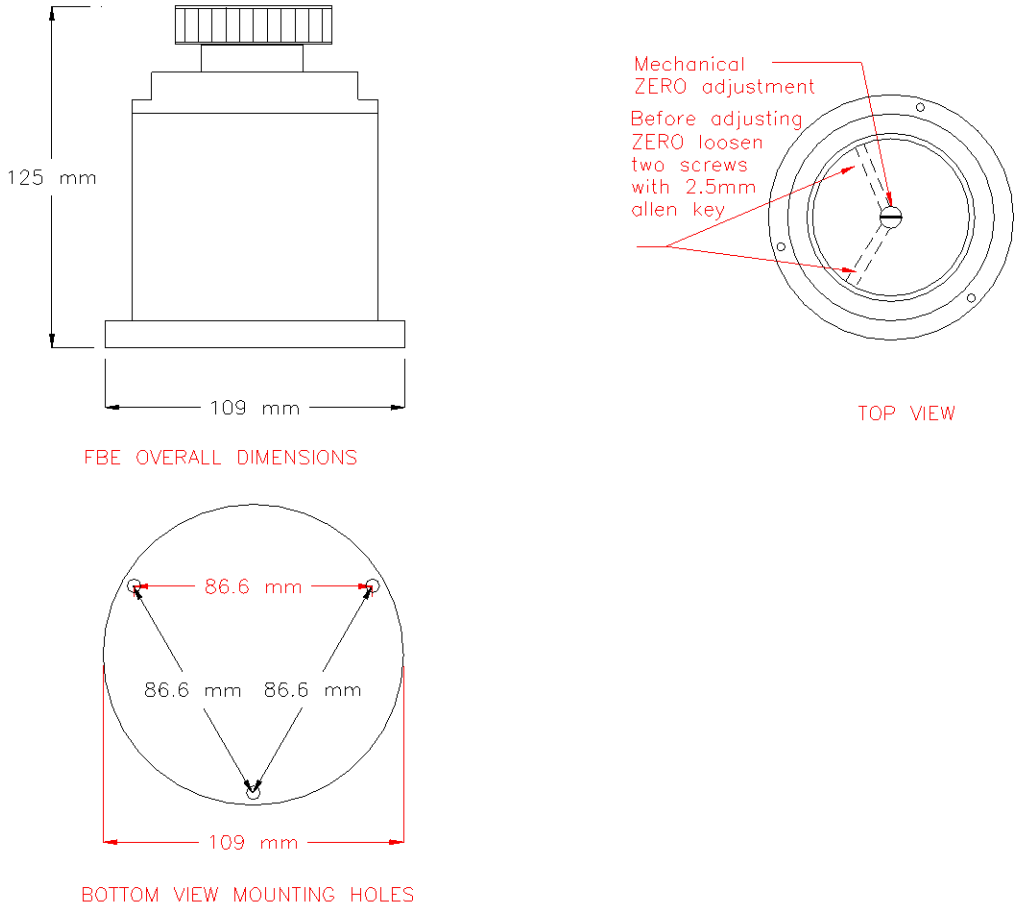


Fig. D.2