

WinFrog Device Group:	GYRO
Device Name/Model:	LEHMKUHL LR40
Device Manufacturer:	Scandinavian Micro Systems PO Box 155 N-1411 Kolbotn Norway Tel: +47 66 81 27 40 Fax: +47 66 80 80 95 E-mail: scansys@sn.no
Device Data String(s) Output to WinFrog:	Serial Output: RS232/RS422 (2 Ports) Unit outputs proprietary format binary data to WinFrog. WinFrog reads last 5 digits for heading
WinFrog Data String(s) Output to Device:	Nil
WinFrog .raw Data Record Type(s):	Type 910

DEVICE DESCRIPTION:

The Lehmkuhl LR40 is a gyro repeater that accepts inputs from a variety of survey and navigation gyros, and converts and outputs heading data in user selectable serial RS232 format. The LR40 can be connected to most types of gyro compasses without any special interface circuits.

Ship's heading is displayed by a four digit LED display. The turning indicator is a ring of thirty solid state lamps. 5 of these lamps are lit at the same time. When the ship turns to starboard, all five lights rotate in a clockwise direction and when the ship turns to port, they rotate in an counter-clockwise direction with a resolution of 6 or 3 steps per degree of turning of the ship.

The Lehmkuhl LR40 outputs are similar to that of the Lehmkuhl LR60 and hence the driver will work for both devices. Both instruments are capable of outputting NMEA, RGC11, ANSCH, and LR40 data strings, however only the binary data output is used by this driver. Should the instrument be programmed to output the NMEA (HDT) string, the (Gyro) NMEA driver could be used.



Lehmkuhl LR40

DEVICE CONFIGURATION INSTRUCTIONS:

Baud Rate: 1200, 2400, 4800, or 9600 (9600 suggested)

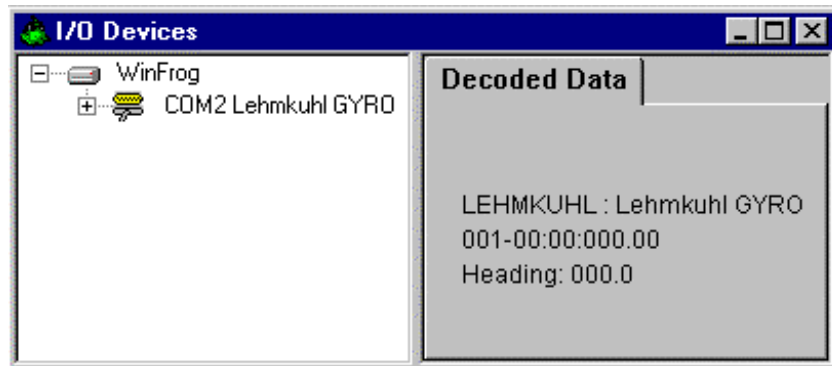
Data Bits: 8

Stop Bits: 1

Parity: None

WINFROG I/O DEVICES > CONFIG OPTIONS:

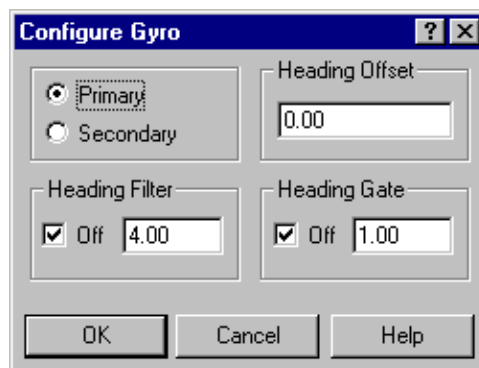
The Lehmkuhl LR40/LR60 is added to WinFrog from the Gyro device category. Adding a LR40 creates a Heading data item, as seen in the I/O Device dialog box below.



No device configuration is required or available at the I/O Device level.

WINFROG VEHICLE - DEVICE > EDIT OPTIONS:

Once the LEHMKUHL LR40 Gyro has been added to the vehicle's Device list, it must be configured to suit the application. In the Vehicle's Device list, highlight the LR40 device and click the Edit button. The Configure Gyro dialog box appears as seen below.



Calculation (Primary/Secondary):

Set the type of calculation to primary or secondary using the calculation radio buttons. Devices set to primary calculation are used to provide the vehicle with a heading. Devices set to secondary are not used in vehicle calculations.

In the case of primary device failure, WinFrog will not automatically use the secondary device(s). You must manually change the secondary devices to primary.

Heading Offset:

A correction value (as determined from a gyro calibration) can be input in the Heading Offset Box. This value is added to the heading value from the Lehmkuhl LR40 to provide a corrected heading for the vehicle. Note that positive or negative values can be entered.

Note also that the Lehmkuhl LR40 is a 'programmable' repeater, which allows for an initial heading to be entered. The repeater then notes the gyrocompass' steps to increase or decrease the heading displayed and output.

Heading Filter/Heading Gate:

The Heading Filter is used to "smooth" heading values used by the vehicle. The value entered in the Heading Filter indicates the number of headings that will be used to predict the next heading value. The larger the value entered, the "heavier" the filter will be – i.e. the slower the vehicle's heading will respond to changes.

The Heading Gate defines a tolerance value to limit the use of anomalies in gyro readings. If the next observed gyro value received falls outside the specified range of predicted values (i.e. plus or minus the entered value), the value will not be used.

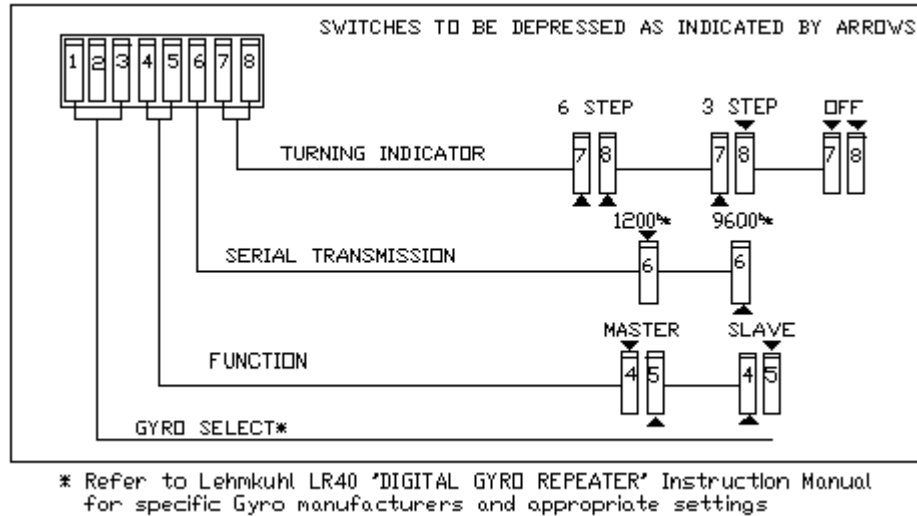
CONFIGURATION DETAILS:

The LR40 can be internally programmed to be a Master Repeater or a Slave Repeater. As a Master Repeater, the LR40 decodes 180:1 or 360:1 transmission signals, displays the ships heading, and controls the turning indicator and the RS422 serial output interface.

As a Slave Repeater the LR40 receives RS422 serial information from a Master Repeater, displays the ships heading, and controls the turning indicator and the RS422 serial output interface.

Setting of the D.I.L. switches (see figure X) determine:

1. Whether the repeater should work as master or as slave.
2. Baud rate of the data output/input.
3. Rate of turning indication (6 or 3 steps per degree turning of the ship).



Programming of SW200 D.I.L Switch

SPECIFICATIONS:

Display:	LED digits and 5LED turn indicator
Gyro Inputs:	3 phase step 24 – 100VDC 3 phase Inductive 24VAC 400Hz 3 phase 360:1 AC Synchro 50-150V 50-500Hz 3 phase 360:1 DC Synchro +/- 24VDC 2 phase 24VDC step (24 steps per degree) Serial RS232/RS422
Serial Output:	RS232/RS422 (2 ports)
Serial Baud Rate:	1200, 2400, 4800, 9600
Serial Output Strings:	NMEA, RGC11, ANSCH, LR40
Accuracy:	Within 0.2 degrees of gyro compass reading at or below max turning rate of 720 degrees per minute.
Power:	110/240 VAC @ 7 Watts
Dimensions:	19 x 10 x 11 cm
Weight:	2.5Kg

Data Protocol:

Start bit 1		
Bit 1	Digit value	LSB
Bit 2	"	
Bit 3	"	
Bit 4	"	MSB
Bit 5	Digit Address	LSB
Bit 6	"	MSB
Bit 7 (M1)	Mode control	
Bit 8 (M2)	"	
	Stop bit 1	
Mode Control	M1 & M2 low: Transmits heading data	
	M1 & M2 high: Transmits special alarm	
	BH 6-5-4-3-2-1	
	0 0 1 0 1 0 = Alarm state in master	
	0 0 0 0 0 0 = No alarm state in master	