



# DIGITAL to SYNCHRO CONVERTOR KW960-C

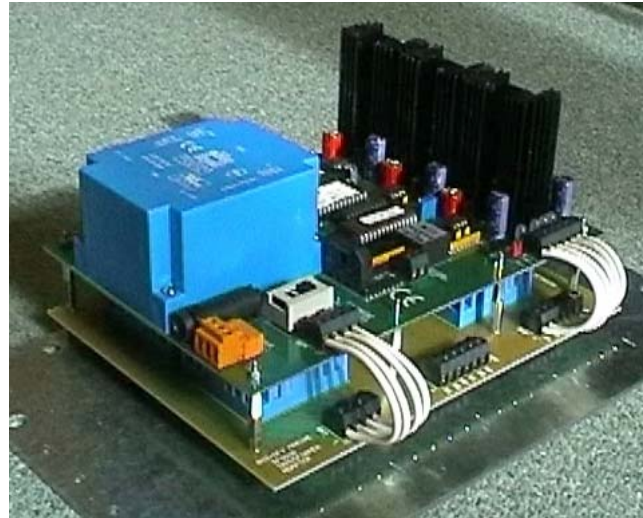
The KW960-C receives data by NMEA 0183 and generates a low power synchro output.

It is used to generate gyro compass, log, wind instrument, or pitch/roll synchro. Applications include the retrofitting a ship with a gyro without a synchro output. The interface will drive typically one or two synchro motors, or numerous electronic interfaces.

The KW960 has a number of different ratios from 1:1 to 360:1. Two KW960s can be used for a coarse and fine servo system as found on military vessels, and with certain gyro compass transmission systems.

The adjustable voltage output is about 40 volts maximum, so it can be used for an Anschutz repeater and others directly. For driving known coarse/fine servo systems the KW960's standard 50v reference output is found sufficient.

The synchro frequency is that of the main power input, so for 400 Hz you need a 400 Hz power source. There is also an option for an external 400/500Hz input.



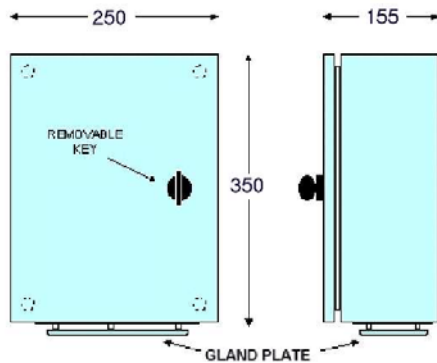
For obtaining 115volt ref, 90 volt signals you need an additional step up transformer adaptor. This is an optional extra, and fits underneath the PCB of the KW960.

## **SPECIFICATION**

**INPUT:** NMEA 0183 heading HEHDT or GPHDT or wind sentence WIMWV.  
Version available for longitudinal bow water/ground speed from VBW sentence.  
Version for pitch or roll. \$IIXDR,A,x.x,D,A,x.x,D, etc sentence

**POWER:** 115/230v 50 to 400 Hz at 10 VA approx. (Transformer secondary 2 x 25 volts)

**SYNCHRO OUT:** Nominal 40 volts line-to-line maximum, adjustable by potentiometer. 5VA total.  
Virtual centre of 3-phase synchro output is at ground.  
**RESOLVER OPTION.** Nominal 20 volts max. (EPROM specific version.)  
**REFERENCE OUTPUT.** 50/60 Hz. Nominal 25 or 50 volts, jumper selected.  
An additional transformer adaptor is needed for 115v reference, up to 90v signals.



**EXTERNAL FREQUENCY INPUT:** There is an input for external reference excitation at 1 to 50 volts. The 3 phase signal output is then at that frequency. This is sometimes used with autopilots, which provide a synchro excitation drive at about 400 Hz. Adjusts for voltage input, by plug-in 4-resistor network.

**ACCURACY:** Within 1 degree of synchro position. Approx 9 bits resolution.

**NMEA INPUT OPTION:** Jumper J3 = 0 = heading. J3 = 1 = Wind angle from \$WIMWV input. Other options possible.

**HEADING RATIO OPTION:** Jumper J2 = 1 = 1:1 ratio. J2 = 0 = the ratio as set in EPROM location. Available ratios 9:1, 10:1, 30:1, 36:1, 90:1, 180:1, 360:1

**LOG SPEED.** J2 = 1 = 200 kts/rev. J2 = 0 = 5 knots/rev  
LOG SPEED 40 knot/rev version

**ENCLOSURE:** Bulkhead mounting enclosure 350 x 250 x 155. Colour grey RAL7032. For a dual (coarse/fine) system 500 x 400 x 155.

**PRINCIPLES OF GENERATING THE OUTPUT:** The input angle is read from the data input. The program rotates the synchro output to any new position, going through all digital states towards it, not just jumping there. This is to attempt to move a synchro smoothly, reducing the jerk caused by any sudden jump of the input. The rotation rate is adjustable by a screwdriver switch from about 2 to 10 degrees per second. There are 360 "steps" per revolution in the 1:1 mode.

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