

Release Notice for Unisyn 16.3 software dated 1/19/99

Purpose of this release:

UniSyn is a new release of the Ockam System software (rev A16.3) that supports three new interface types. The software continues to support all standard interfaces, but some new features will not be activated unless the new interface/sensors are installed. The changes described are relative to standard CPU software A14.4.

New Heading: The 032B eSeries Compass Interface supports the KVH Azimuth GyroTrac 3-axis gyro-stabilized compass, and provides pitch and roll in addition to a more responsive, automatically compensated heading input. When available, the roll input replaces the heel sensor input of the 022 Masthead interface, and the pitch input provides two new functions; Trim and Sea State.

The Trim (average pitch angle) function is the same as that provided by the 062 Trim Interface. Sea State is the mean value (RMS) of the pitch angle changes, and reflects the amount of "undulation" the boat is experiencing. This function has been used by several America's Cup syndicates, and the IMS technical committee to quantify the sea state.

New Masthead: The 099AZ1 Sonic Wind Interface provides support for the new Sonic Wind sensor. This sensor has no moving parts, and so has no lag or friction. Disturbances caused by tacking are not spread out in time, and therefore do not degrade the wind direction solution beyond the evolution itself. In addition, pitch and roll rate correction can be more effectively applied to the fully responsive measured apparent wind, which reduces errors produced by these disturbances. The much greater sensitivity of the sonic sensor also improves downwind wind direction solutions.

Enhanced GPS: UniSyn supports the enhanced GPS interface 041B. In addition to waypoint range and bearing and Lat/Lon, the extended interface provides Cog/Sog, Time, Magnetic Variation and a Differential GPS flag. The enhanced GPS interface is backward compatible with earlier versions of CPU software.

New Current: UniSyn now uses GPS Cog/Sog to produce a much more responsive current calculation. Changes in current are visible in seconds rather than the minutes of the old CPU software. *It is no longer necessary to have an active waypoint within 10 miles for an accurate current calculation.*

Log Functions: Since UniSyn uses a new method to calculate current, the Trip Log now extends to 1000 miles. We regret the elimination of the following log functions, Back Range and Bearing, Permanent Log, Distance Lost Boatspeed, and Distance Lost VMG.

Alternative track: UniSyn can now use COG and SOG to replace boatspeed and heading. This capability allows system operation at high latitudes where compasses are unreliable, and where boatspeed is broken.

Wind trend Two new functions have been added to help monitor true wind. They display the shift (angle) and puff (speed) of the current wind relative to average. These functions replace the DLVS (shift) and DLVMG (puff) functions.

Windweight A new Option has been added to adjust the displayed true wind speed to allow for changes in wind gradient. This adjustment only applies to the Windspeed True display and the windspeed input to the Polar and Target functions.

Release Notice for Unisyn 16.3 software dated 1/19/99

Light control The back range & bearing controller card now controls lighting level for Magnum displays.

Friction Offset: The signature setting "B" on the 022 Apparent Wind Interface now uses a default offset of 0.6 Knots (CPU 14.4 was 2 Knots). The Cal. Windspeed will need to be increased 0.05 to 0.10 to compensate for the 1.4 Knots difference. This change is made to better match the new bearings in the 213 B&G MHU. A user defined offset can be entered with the K10=n command.

Revisions of A16:

- 6/25/98 A16.1 First release.
- 11/13/98 A16.2 Mt and Vt trend functions added.
- 1/19/99 A16.3 Fixed problem with true (vs. magnetic) COG/SOG input from GPS. 041 GPS interface now includes parsing of RMC sentence. Added O21= control for Mt trend.

Equipment supplied:

5 program EPROMs marked "UniSyn" for the CPU, replace the 4 EPROMs of A14.4.

New and Changed Commands:

Upwash Slope, Windspeed Offset under keyboard control. Improved buffer control. Changed default averaging. Disable tags. Vertical windspeed. Way faster current set & drift. Time set from GPS. Differential GPS flag. MagVar from GPS. Can use Cog/Sog in place of Vs/Ms. Mt,Vt trends replace DLVS/DLVMG.

A7=<secs> Sets Mt trend average (was DLVS average).

A8=<secs> Sets Vt trend average (was DLVMG average).

D<tag>={1|0} Controls output of functions. D<tag>=1 disables <tag> while D<tag>=0 enables it. Tag can be entered literally (e.g. DB=1 for boatspeed) or numerically (e.g. D\65=1 for apparent wind speed). If any tags other than Synopsis (tag ':') are disabled, Error 17 will be displayed as a reminder. To enable all tags, enter D\0=0.

K9=<upwash slope>

Upwash slope is a calibration number that changes Upwash with True Windspeed. The new Upwash function is

$$Upwash = [Kupwash + KupwashSlope \cdot (Min(Vt, 35) - 12)] \cdot Sign(Ba) \cdot Sin^{2.5}(6 * (180 - |Ba|)) \cdot Ref^2 \cdot Flat$$

One way to determine the correct slope is to set KupwashSlope to zero and calibrate using Kupwash only, for two True Windspeeds; one at 12 knots and the other at say 18 knots. Calculate the KupwashSlope from the relation

$$KupwashSlope = \frac{Kupwash_{18} - Kupwash_{12}}{18 - 12}$$

Then set Kupwash to the 12 knot value and KupwashSlope to the calculated value. The Upwash Slope can be entered by the spare Cal pot on the 022 Apparent Wind Interface or by the K9=n command. The Cal Upwash can be entered by the Upwash pot or by the K6=n command. The Cal Upwash Function Card will alternate between Upwash (0.0) and Upwash Slope (.00). It is best to

Release Notice for Unisyn 16.3 software dated 1/19/99

set Upwash Slope to 0 until enough data is collected to get a clear plot. Most boats have a slope the falls between +0.200 and +0.350.

K10=<Va Offset> This calibration allows one to set an offset different than the default. This number represents the amount of wind needed to start the cups moving. It is added to the speed reported by the windspeed sensor. It can only be entered by the K10=n command; no calibration screw exists for this. See Manual section xx for default value.

O10=<0..3> Because Cog/Sog is now output on its own tag, O10=2 which used to set tag "f" to Cog/Sog instead of Vmc has been changed. Option 10 now controls Vmc rhumbline and Opposite Tack.

O10=	Vmc rhumbline	Opposite Tack
0	Waypoint bearing	With current
1	Option 11 value	With current
2	Waypoint bearing	Without current
3	Option 11 value	Without current

O14=<knots> Sets the limit that current magnitude updates. Default is 0.1 knot per GPS update.

O15=<0..1> Sets the percentage of new measured current to be applied (i.e. smoothing). Default is 0.25 (25%); maximum is 0.999, minimum is 0. To increase response, increase the number.

O16=<0..3> Enable GPS COG and SOG as replacements for paddle and compass + leeway. O16=0 sets paddle & compass; O16=1 sets SOG & compass; O16=2 sets paddle & COG; O16=3 sets SOG & COG.

O17=<lubber> Set the compass offset (lubber line). Input is degrees.

O18=<devamp>

O19=<devphase>

Sets compass deviation parameters.

$$Hdg = HdgMeasured + O18 * SIN(HdgMeasured + O19)$$

O20=<k> Adjust the Windspeed True display and input to polar functions. The displayed wind speed is k*Measured_Windspeed_True (default is 1.0, i.e. 100%). The number is saved on power-down.

O21=<Ref Mt> Sets a manual reference wind direction for Wind Direction Trend. To return to automatic centering, enter ctrl-U.

Q<tag>=<n>[,<m>] Queries for 1=Program rev, 2=System flags, 3,m=Average m value in seconds, 4,m=Option m value, 5=disabled tags.

The Q command is a way to query the CPU for settings that are not output to the bus. The answer will be output to the tag specified (User 0 for instance). To find the average for Wind Direction for example, enter the manual command Q0=3,14. The current averaging value will display on User 0.

New and Changed Functions:

1. DLVS has been replaced by Wind Direction Trend. The tag remains 'V', but the function is now angle (Mt minus a long-term average Mt). The averaging time defaults to 3 minutes, and is adjustable with A7= command. The average can be reset to current value by sending ctrl-U (i.e. the old DLVS display card and controls should be relabeled "Mt Trend").

Release Notice for Unisyn 16.3 software dated 1/19/99

VARDAT="V",4,5,6,1,dMt,"Mt Trend"

DLVMG has been replaced by True Windspeed Trend. The tag remains 'v', but the function is now signed knots (Vt minus a long-term average Vt). The averaging time defaults to 3 minutes, and is adjustable with A8= command. The average can be reset to current value by sending ctrl-V (i.e. the old DLVMG display card and controls should be relabeled "Vt Trend").

VARDAT="v",1,1,5,1,dVt,"Vt Trend"

- The Back Range & Bearing function has been removed. The controller card (ctrl-B) now cycles the lighting level for Magnum displays. 005 displays will show "----".
- When the 099AZ1 sonic interface replaces the 015 Masthead interface, the following functions are enabled.

- Axial Windspeed Apparent (tag "+", 00101011) is the component of apparent wind along the mast (positive is up). Outputs 4/sec, average number 26, default is 2 seconds. To acquaint OckamSoft with this function, you should include the following line in your OK.DAT file.

VARDAT="+",1,1,5,1,"Vax","Wndspd App Axial"

- Synopsis (tag ".:") (normally disabled) becomes 21 chars long. The sonic data substitutes for windspeed counter and S1..S3 voltages. The new synopsis looks like

ppssaaaaxxxxbbbhhmmm

where **pp** and **ss** retain their old meaning (port and stbd boatspeed counters)

aaaa is horizontal app wind speed in mtr/sec*100 Hex; e.g. "031D" indicates 15.5 knots horizontal apparent wind speed

xxxx is axial app wind speed in mtr/sec*100 Hex; e.g. "FFAC" (-100 decimal) would be output when Vax is blowing down at 1 mtr/sec

bbbb is horizontal app wind angle in tenth degrees Hex; e.g. "072F" indicates an apparent wind angle of -22.5 degrees

hh and **mmm** retain their old meanings (heel and heading).

- When the 099BQ2 3D Compass Interface and sensor is attached, Pitch (trim) is output on tag "^" (magnet pattern 01011110, wildcard code 24567) and Seastate is output on tag "~" (magnet pattern 01111110, wildcard code 234567). The old Trim interface Pitch output was on tag "N" (and still will be if it's attached).

VARDAT="^",1,0.1,5,1,Bp,"Pitch"

VARDAT="~",2,0.1,5,1,Ss,"Undulation"

- When the extended GPS (041C) is installed, several new functions are enabled:
 - GPS Cog/Sog is transferred into the instrument system and output on tag "U" (magnet pattern 01010101). It is also used to calculate current, resulting in a more responsive output than previously. This also eliminates the requirement that the waypoint be within 10 miles. Enable Cog/Sog output from the GPS (sentence VTG).

VARDAT="U",3,10,5,0,Cog,"Grnd Course"

VARDAT="U",2,1,5,2,Sog,"Grnd Speed"

- GPS time resets the instrument system clock on power-up. To enable this function, enable sentence ZDA on the GPS.
- GPS magnetic variation is output in place of the value entered in the compass interface. OckamSoft will use this value in preference to the chart Magnetic Variation. To enable this function, enable sentence HVD or HVM on the GPS.

Release Notice for Unisyn 16.3 software dated 1/19/99

- Latitude and Longitude will output consecutively rather than Lon following Lat by 1/4 second.
6. Current (tag 'F') is now calculated from COG/SOG rather than Waypoint, and requires the 041C interface for automatic calculation (see #3 above). Older style interfaces (040 and 041B will not produce current output anymore. The C= command still allows manual entry.
 7. Opposite Tack (tag 'O') now takes into account current by default; i.e. Opposite Track (see Option 10).
 8. Vmc (tag "f") can no longer be switched to COG/SOG (see Option 10 above).
 9. Synopsis (tag ":",) is now disabled by default. To enable synopsis, enter D:=0. Also see changes in format with sonic masthead above.

New and Changed Error Codes:

- Error 14 This is a programming flag. Ockam should be contacted if you get this error.
- Error 15 Calculation falling behind. Disable unneeded outputs (D= command).
- Error 16 Keyboard buffer overflow. Usually caused by RS-232 connector disconnected from computer.
- Error 17 One or more tags are disabled (see D= above).
- Error 27 Substituting GPS SOG for boatspeed (See Option 16).
- Error 47 Substituting GPS COG for heading+leeway (See Option 16).
- Error 73 No waypoint input (missing GPS Waypoint data); was Waypoint moved in A14.4.
- Error 74 No current being calculated; was Waypoint timeout in A14.4.
- Error 75 No Lat/Lon input (missing GPS Lat/Lon input); was Current not calculated in A14.4.
- Error 76 No COG/SOG input (missing GPS COG/SOG). Was Waypoint locked in A14.4.
- Error 77 Using Manual Current input (C= command); was Waypoint disabled in A14.4.
- Error 78 Using Manual Waypoint input (W= command).
- Error 79 No differential GPS. Occurs if you had DGPS previously, and then lost it.

New Default Average Values:

Windspeed true	8 sec
Windangle true	8 sec
Windangle apparent	4 sec
Windspeed apparent	6 sec
Boatspeed	6 sec
Wind direction	8 sec
Wind trends	10 min