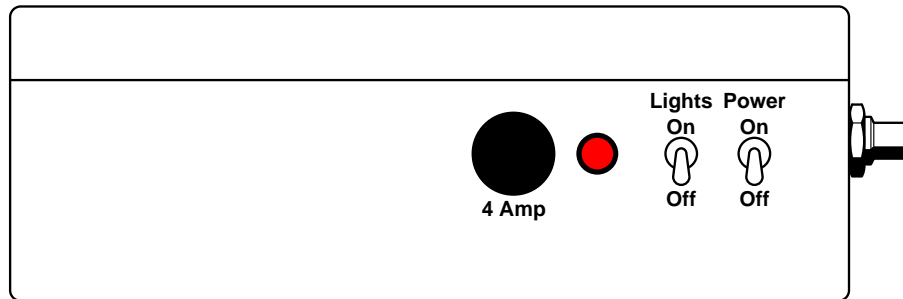


001 System Processor



The CPU is the central processor for the Unisyn system. It gathers information from all interfaces and controllers, calculates the outputs, and sends data to the displays. Included in the CPU is a clock running on an internal battery which provides various timing functions to the system.

Specifications

Dimensions:	12-1/2" W x 9" H x 4" D
Mounting:	#10-24 x 2" Bolts on 9-1/2" x 4-5/8" Ctrs.
Weight:	4 Lb.
Orientation:	Any
Accessories:	System Manual 001C Power cord Mounting hardware (2) 3AG-4A Fuses 5 System Cards
Power Requirements:	10.5 to 35 VDC at 150ma plus current requirements of all other modules.
Fuses:	Power: 3AG-4 AMP Ground: 10 Amp Picofuse Signal: 125ma Picofuse
Mating Connectors:	POWER: AMP CPC 206060-1, Cable seal 54010-1 BUS: BNC Male (UG-88/U)
Features:	Two switches control power and lights, or may alternatively be controlled through the power cable wiring. A trouble light aids in diagnosing power and error problems.

Operation

System power starts at the ship's lighting battery and flows through a battery disconnect switch, a circuit breaker on the power panel, the POWER switch and a 4 ampere fuse on the CPU. (Ground faults are protected by an internal 10 amp fuse soldered into the circuit board.) To turn the system on, the various ships switches should be turned on, along with the POWER switch on the CPU. When proper power is applied, the system begins operation. The power-up sequence takes about 5 seconds;

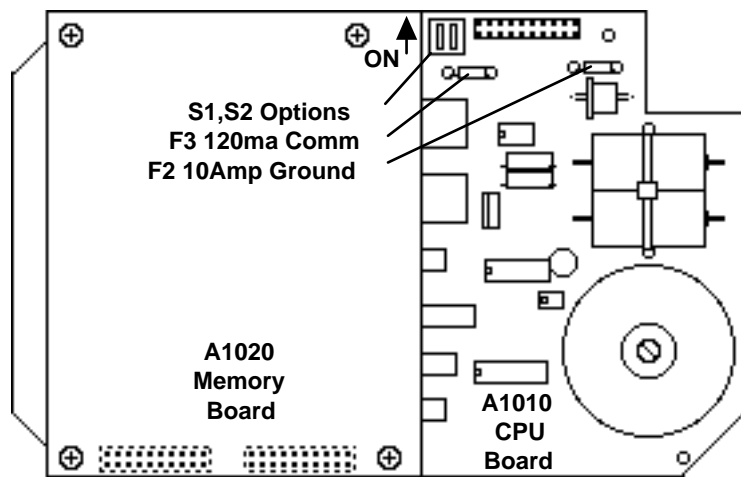
- 1 Power is supplied to the BUS, causing indicators to display all eights with punctuation !+8.8:8.8 .
- 2 The CPU sends HI to all indicators, which shows the program revision P14.3 or whatever the current revision is.
- 3 Normal operational data is sent to the indicators.

The POWER switch may be left in the ON position, allowing the system to be controlled by the ship's circuit breaker.

Also see [Resetting the CPU](#).

Installation

The CPU module requires a supply of 12 to 32 volts DC, at up to 3 amperes (depending on the number of modules attached). Power connection is made via a three conductor cable; BLACK to ground, WHITE to (+) power, and optionally, GREEN to switched (+) power for lighting control. Lighting may be controlled by the LIGHTS switch on the CPU, or by the GREEN wire on the power cable. If the switch is used, then the green wire should be taped up out of the way; if the green wire is used, then the LIGHTS switch should be set to the OFF position, and the green wire should be connected to a SWITCHED supply. It is important to have control of the lights, because the light switch is used to reset the CPU.



Location of Options Switches inside 001 CPU

Normally, the units-of-measure for the Ockam System are in Feet & °F. You can set them to Meters & °C by setting the internal Options switch 1 ON & switch 2 OFF, then performing a Master Reset. Any other switch setting sets defaults to °F and Feet. This switch only has an effect when a Master Reset is performed. You can change the output units individually or collectively with Option 12, and they will stay at the new setting until another Master Reset is performed.

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

Unisyn is a new release of the Ockam System firmware for the 001 (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 CPU software A14.4.

New Heading: The 032B Compass Interface supports many 3-axis compasses, providing pitch and roll in addition to heading. When available, the roll input replaces the heel sensor input of the 022 or T2 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: Unisyn supports the T2 Multiplex Interface which supports the new Sonic Wind sensors. These sensors have no moving parts, and so have 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 041 GPS interface. 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.

Note

Older systems upgrading to Unisyn with 041 may notice a change in system configuration. This is because with Unisyn, the 041 does not need to also configure as a “Q” interface (config=512) in order to send Lat/Lon. If the system does not have any other “Q” interfaces, the configuration will drop by 512 when switching to Unisyn.

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.

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.

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").

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"

2. 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 "----".
3. When one of the sonic interfaces is used, 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 to 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).

4. When a 3D Compass 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"

5. When the extended 041 GPS 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.
 - 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.

Model 001 Cpu Revision History

Rev	Date	Change
A2	6/1/82	Board E1020A1, U11-6 TO +5, U9-1 TO GND. Software S001A6
A3	6/19/82	Board E1010A2, Remove C13, U5-13 TO +5. Board E1020A2, U12-6 TO GND. SOFTWARE S001A6
A4	7/14/82	SOFTWARE S001A8B
A5	10/1/82	SOFTWARE S001A9A
A6	3/9/83	Board E1010A2, C10 from 4.7 to 68 uf. SOFTWARE S001A10
A6A	5/20/83	SOFTWARE S001A10A
A7	6/14/83	SOFTWARE S001A10B
A8	7/6/83	SOFTWARE S001A10D
A9	2/1/84	Major change to RAMEN circuit and 5V supply to help eliminate RAM lost (error 12). SOFTWARE S001A12
A10	3/1/84	Board E1010A4, E1020A3
A11	1/2/86	Software S001A14
A12	10/1/87	Add DF255 fuse to protect Q111 FET in case clock stops w/FET on.
A13	2/15/89	Software S001A14.2. Adds depth in meters/ft to Option 12.
A14	5/1/89	Board E1010B1. Add switch for Euro mode, Ground fuse.
A15	6/14/89	Software S001A14.3. Mast rotation, Euro switch code, A15 wind triangle.
A16	1/19/99	Software S001A16.3 Unisyn upgrade.