

USER MANUAL

ICSYS SUBSEA DISPLAY



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03.05.2018	A	Released
25.02.2021	B	Added more detailed information
09.03.2022	C	Updated to match Display Revision C (with RGB LEDs)
27.03.2023	D	Added RS232 and changes in web GUI

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ICSYS SUBSEA DISPLAY

1. INTRODUCTION

1.1. PURPOSE AND SCOPE

This document outlines and defines the configuration and operation of the iCsys Subsea Display

The manual is to be used by trained and competent personnel only.

1.2. ABBREVIATIONS

Abbreviation	Description
PCB	Printed Circuit Boards
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
IP	Internet Protocol
EEPROM	Electric Erasable Read Only Memory
RTC	Real Time Clock
8-N-1	8 data bits, no parity, 1 stop bit

1.3. SUPPLIER CONTACT INFORMATION

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 Postvegen 610
 N-4351 Kleppe
 Norway

+47 51 42 22 22

post@icsys.no

www.icsys.no

1.4. DOCUMENT REFERENCES

DOC No.	Description
100963-ICS-MC-DWG-001	GA Drawing
100963-ICS-PD-DAS-001	Datasheet

2. HEALTH, SAFETY AND ENVIRONMENT

2.1. GENERAL

Safety Notes and General Precautions shall be presented to all personnel concerned prior to testing, operation, maintenance, and repair. The operations shall be performed by the responsible engineer/supervisor. The personnel performing this job shall have knowledge of this type of equipment and have familiarized themselves with the applicable procedures and manuals for this product.

2.2. USER HEALTH AND SAFETY

This product is made to operate under many circumstances and specific cases for health and safety will not be described here but must be considered by the equipment manufacturer or owner.

2.3. QUALIFICATIONS AND TRAINING

It is essential that operating personnel have been given training and education how to operate and maintain the software and equipment described in this manual. It is also essential that operating personnel have general operational experience.

The personnel responsible for the operation of this system must be appropriately qualified. The operating company must do the following tasks:

- Define the responsibilities and competency of all personnel handling this system.
- Provide instruction and training.
- Ensure that the contents of the operating instructions have been fully understood by the personnel.

2.4. NON-COMPLIANCE RISKS

Failure to comply with all safety precautions can result in the following conditions:

- Death or serious injury due to electrical and mechanical influences
- Product damage
- Property damage
- Loss of all claims for damages

2.5. UNACCEPTABLE MODES OF OPERATIONS

The operational reliability of this product is only guaranteed when it is used as designated. The operating limits given in this manual shall not be exceeded under any circumstances.

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3. TECHNICAL INFORMATION AND DATA

3.1. TECHNICAL DESCRIPTION

The iCsys Subsea Display is made to display and log data provided by connected sensors.

Data logged in the display can be extracted as CSV files by connecting to a Wi-Fi network provided by the display. Alternatively it can be extracted over a wired connection.

Web interface for configuration allows adjustment of parameters like scaling, symbols, colors and more.

3.2. TECHNICAL DATA

General	
Manufacturer	iCsys AS
iCsys Part Number	100963
Description	Subsea Display 6-Digit
Weight	3840g
Dimensions	346 x 100 x 108mm
Depth Rating	3000m
Supply Voltage	10-30VDC
Power Consumption	26mA idle and ~150mA in typical use @ 24VDC (depending on symbols and intensity displayed)
Communication	Ethernet 10/100Mbps, RS232 115200 baud 8-N-1
Connector	Glenair G5506-2013-0004 22AWG
Analog Input	2ea 4-20mA
Digital Input	2ea NPN or PNP (jumper selectable inside display)
Encoder Input	The digital inputs can be used for a one-way encoder using only input 1 or a two-way encoder using both inputs

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4. DRAWING

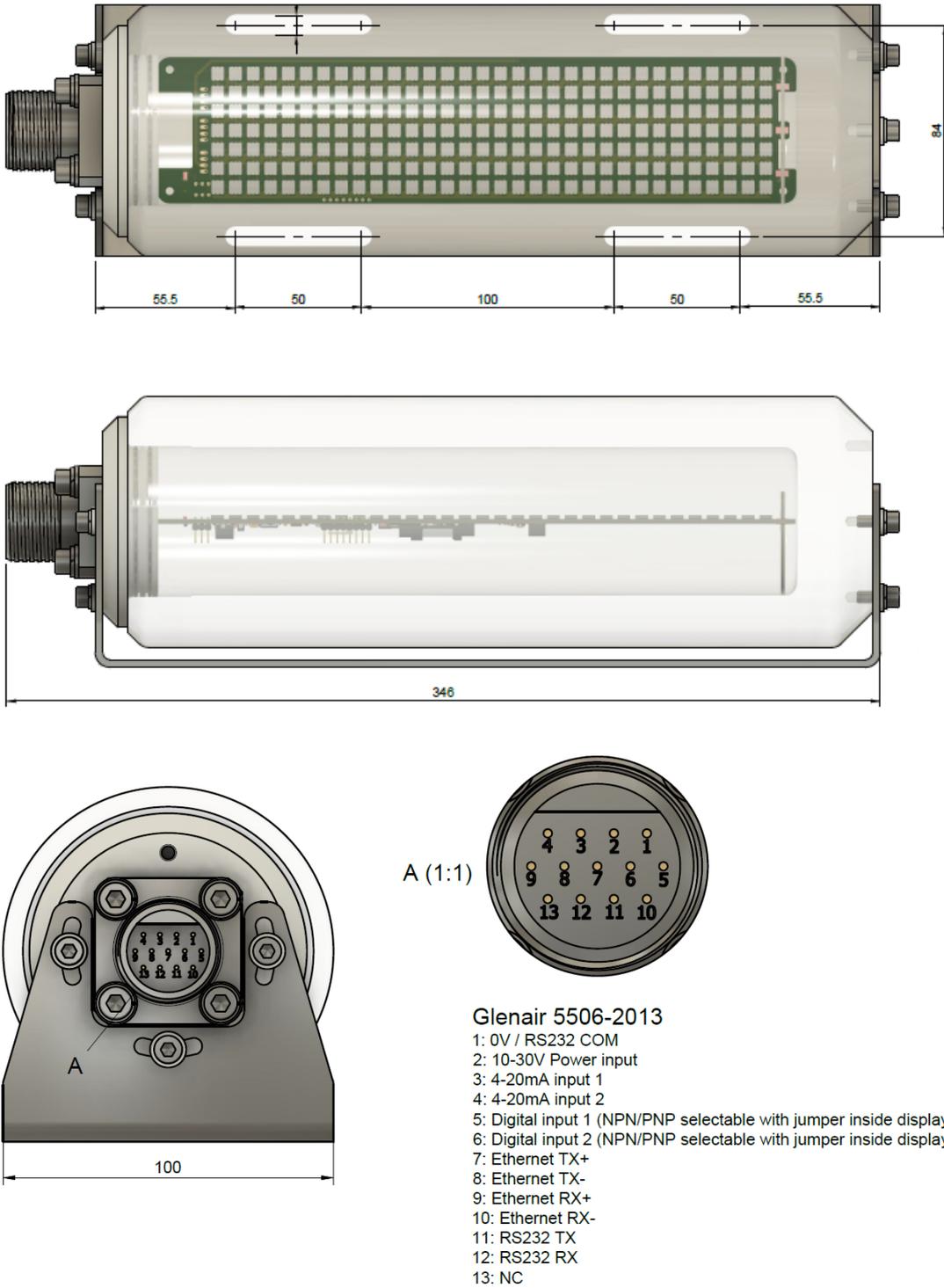


Figure 1 – Display Dimensions and Pin Configuration

5. CONFIGURATION

To configure the parameters in the display, use any available computer and connect to the Wi-Fi network provided by the display itself. Inbuilt DHCP will provide IP address and there is no need for manual IP configuration.

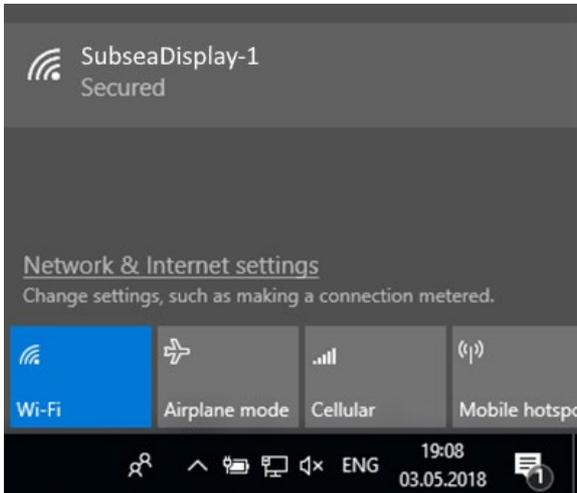


Figure 2 – Connect to Wifi network provided by the display

Use a web browser and enter the IP address of the display (192.168.1.1) in the address bar to access the inbuilt web server. The first page to show is the “Configuration” page. Use the four buttons in the upper right corner to navigate to the different pages.

Alternatively, it can be configured on a wired ethernet connection using the IP address 10.0.37.235.

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5.1. CONFIGURATION

To configure input scaling and other display parameters, navigate to the “Configuration” page.

Use the Input and Output scaling table on each of the four inputs to transform input raw values to scaled values. Use 0-0 and 1-1 scaling to observe raw values on the “Live Data” page to find the raw values to use in the scaling table. Press the “Add Point” button to add more scaling points for an unlinear scaling and press the “Update Graph” to get an updated visual representation of the scaling.

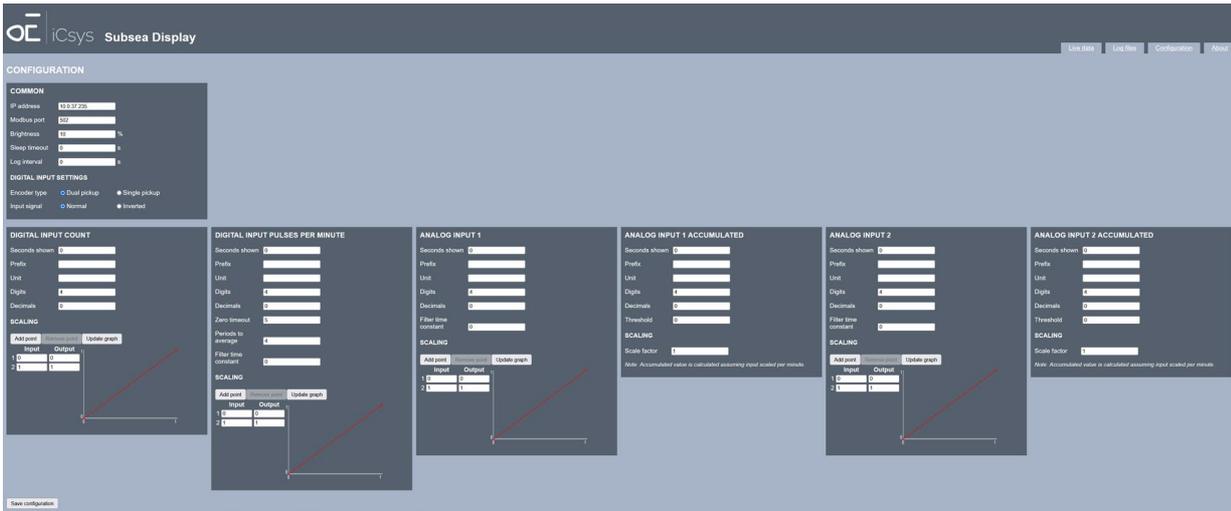


Figure 3 – Web server “Configuration” page

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Description of all other parameters are described below.

IP address	This is the address on the physical Ethernet port. This is only needed for commanded display data from external system
Brightness	0-100% Brightness on the display. Default is 10%
Sleep Timeout	Time in seconds with no light against the display before it enters standby mode. In standby mode it will continue to log sensors, but the Wifi and Display LED`s are shut down to save power. Set this to 0 to disable the standby feature.
Log Interval	Interval in seconds to log all sensor inputs to .csv file. Set to 0 to disable this feature.
Encoder type	The display has two digital inputs, these can be used in pair as up/down pulse counter or as one directional counter using only input #1
Input Signal	Normal or Inverted pulse signals on the digital inputs
Seconds Shown	Number of seconds to show this input before shifting to the next. Set to 0 to jump over an input.
Prefix	Symbols or text to show to the left of the input value
Unit	Symbols or text to show to the right of the input value
Digits	Number of digits to show for the input value
Decimals	Number of decimals to show for the input value

5.2. LOG FILES

To extract logged data, navigate to the “Log Files” page and click the desired file from the table.

Use the “Delete all log files” button to clear the micro-SD card inside the display for all log files.

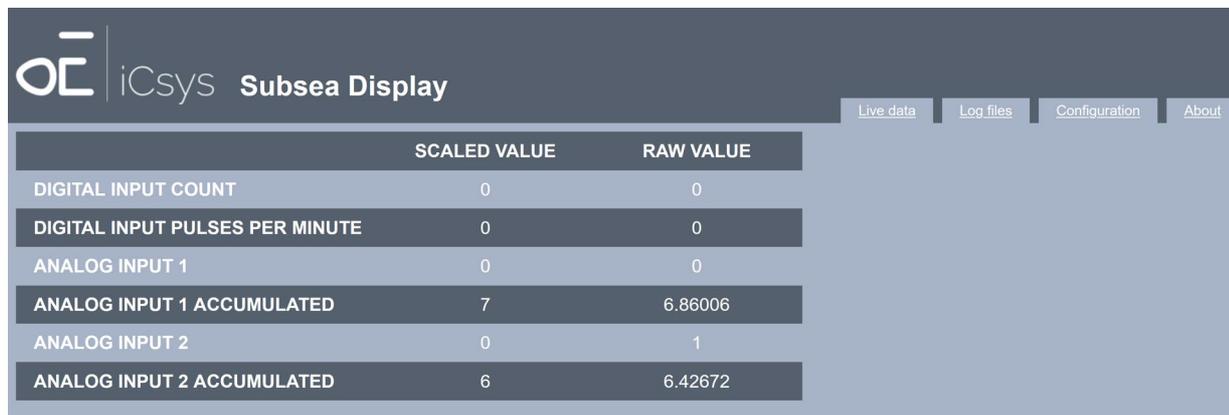


Figure 4 – Web server “Log Files” page

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5.3. LIVE DATA

The “Live Data” page shows the current input signals present on the analog and digital inputs. Use this page to verify or troubleshoot any sensor problem.



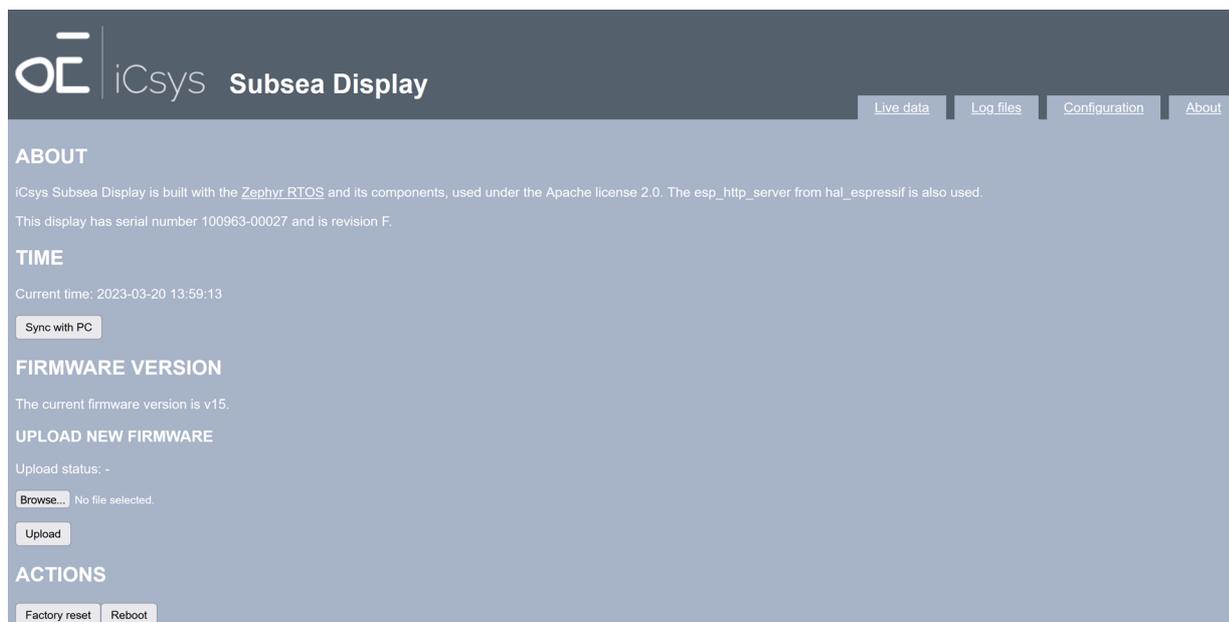
	SCALED VALUE	RAW VALUE
DIGITAL INPUT COUNT	0	0
DIGITAL INPUT PULSES PER MINUTE	0	0
ANALOG INPUT 1	0	0
ANALOG INPUT 1 ACCUMULATED	7	6.86006
ANALOG INPUT 2	0	1
ANALOG INPUT 2 ACCUMULATED	6	6.42672

Figure 5 – Web server “Live Data” page

5.4. ABOUT

The “About” page holds information on hardware and firmware versions and it allows for firmware updates if any update file is provided by iCsys AS.

The real time clock is adjusted by a click on the “Sync with PC” button. Make sure the PC clock is correct prior to this and be aware that the Display clock shows UTC time (and also the timestamp in all log entries).



ABOUT

iCsys Subsea Display is built with the [Zephyr RTOS](#) and its components, used under the Apache license 2.0. The esp_http_server from hal_espressif is also used.

This display has serial number 100963-00027 and is revision F.

TIME

Current time: 2023-03-20 13:59:13

FIRMWARE VERSION

The current firmware version is v15.

UPLOAD NEW FIRMWARE

Upload status: -

No file selected.

ACTIONS

Figure 6 – Web server “About” page

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6. OPERATION

6.1. NORMAL OPERATION

The display will log sensor data continuously while powered. The data is stored on micro-SD card inside the display in a .csv format. The data can be accessed through wired ethernet, or Wi-Fi built into the display as described in the “Log Files” section of this manual.

The display will begin logging to a new file every time it is powered up and the interval is configurable as described in the Configuration section of this manual.

At “power on” the display will first show the current date and then the clock and then the supply voltage. Verify that these are correct or adjust if needed.

7. MAINTENANCE

7.1. CHANGE REAL-TIME CLOCK BATTERY

The display includes a real-time clock circuit that stores time and date information. This circuit is driven by its own CR2032 coin battery. It is recommended to replace this battery every two years. A drop of silicone is used to secure the battery in place. After battery replacement the clock must be synced on the web interface “about” page.

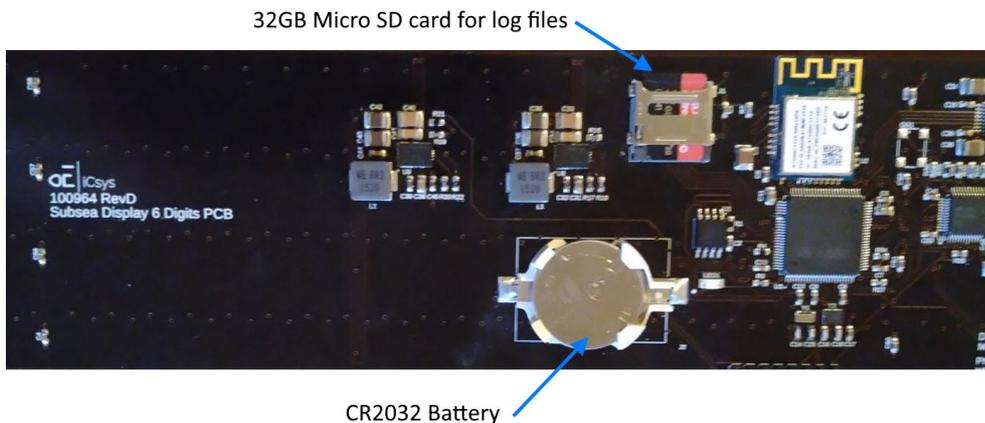


Figure 7 – Location of clock battery and micro-SD card

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8. COMMUNICATION PROTOCOL

Not yet implemented.

9. TROUBLESHOOTING / FAULTFINDING

The below list is meant to provide some hints for troubleshooting but does not guarantee that the issue is covered by the list. Operational feedback will be used to extend the list in future revisions.

Trouble shooting		
Symptom	Possible Causes	Remedy
Nothing is displayed	<ul style="list-style-type: none"> • Timeout due to dark light sensor 	<ul style="list-style-type: none"> • Adjust timeout configuration • Use a light source against the front of the display to wake it up
	<ul style="list-style-type: none"> • No input is configured to show 	<ul style="list-style-type: none"> • Increase the "Seconds Shown" parameter of an input above 0sec.
	<ul style="list-style-type: none"> • No power to the display 	<ul style="list-style-type: none"> • Check that correct power is supplied
The clock does not tick	<ul style="list-style-type: none"> • Empty clock battery 	<ul style="list-style-type: none"> • Replace the clock battery
No Wi-Fi network present	<ul style="list-style-type: none"> • No power to the display 	<ul style="list-style-type: none"> • Check that correct power is supplied
No communication to the display by commands over Ethernet	<ul style="list-style-type: none"> • Incorrect wiring 	<ul style="list-style-type: none"> • Check the wiring and verify positive ethernet link status where the display is connected
	<ul style="list-style-type: none"> • No power to the display 	<ul style="list-style-type: none"> • Check that correct power is supplied