

SmartDiver[®]

MUD DIVER[®]

POCKET GUIDE

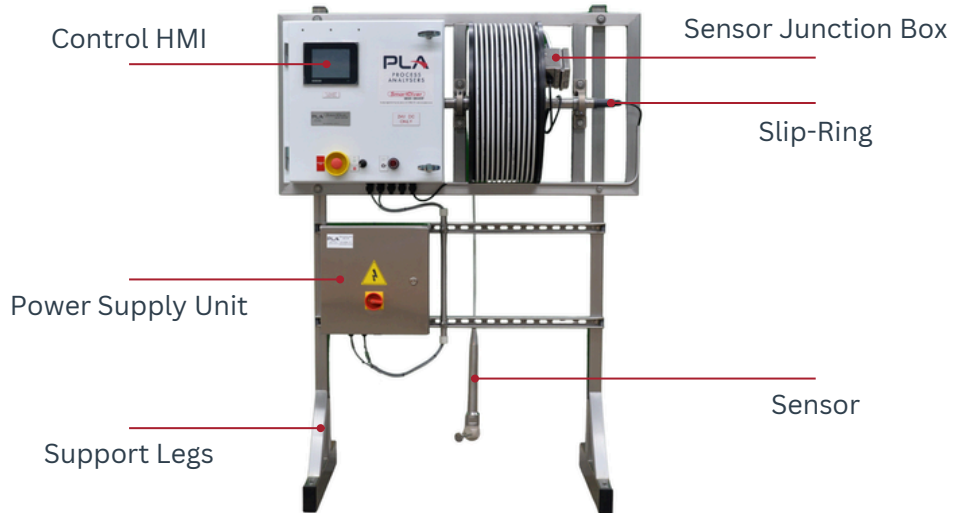
OPERATING & CONFIGURING

I N D E X

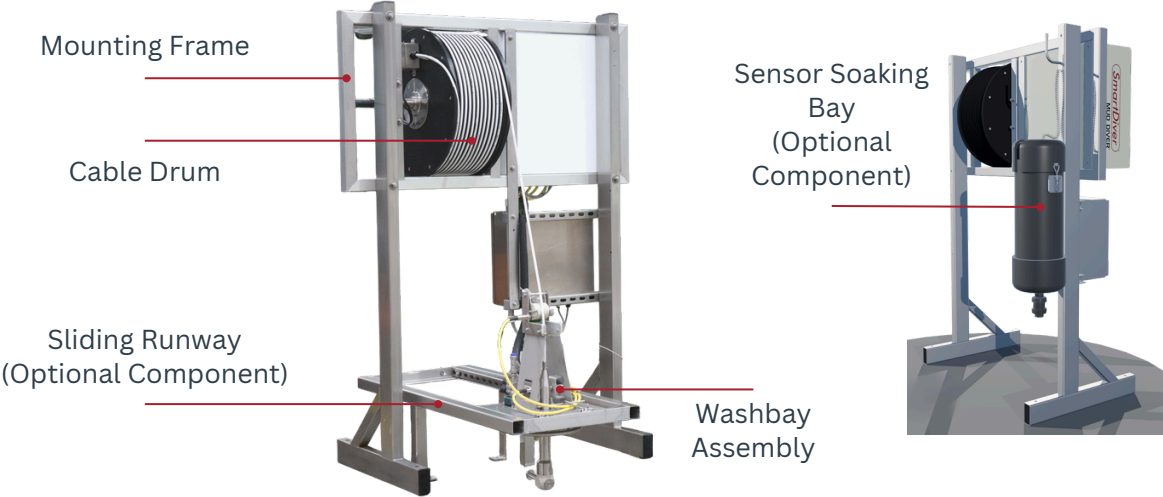
SmartDiver® & Washbay Components	3
Control Panel & Enclosure Components	6
HMI - Screen Overview	8
I/O - Screen Overview	10
HMI - Trend Screen	11
HMI - Profile Screen	13
Dive Profile Explanation	14
HMI – Log in Access & System Page	17
HMI – Configuration Page & System Logs	18
HMI – Setup Page & Saving Data Log	19
HMI - Manual Operation & Disclaimer	21
HMI - Sensor Cleaning	23
HMI - Alarm Screen	24

Note: *This guide applies to standard builds only. Special configurations may have different components.*

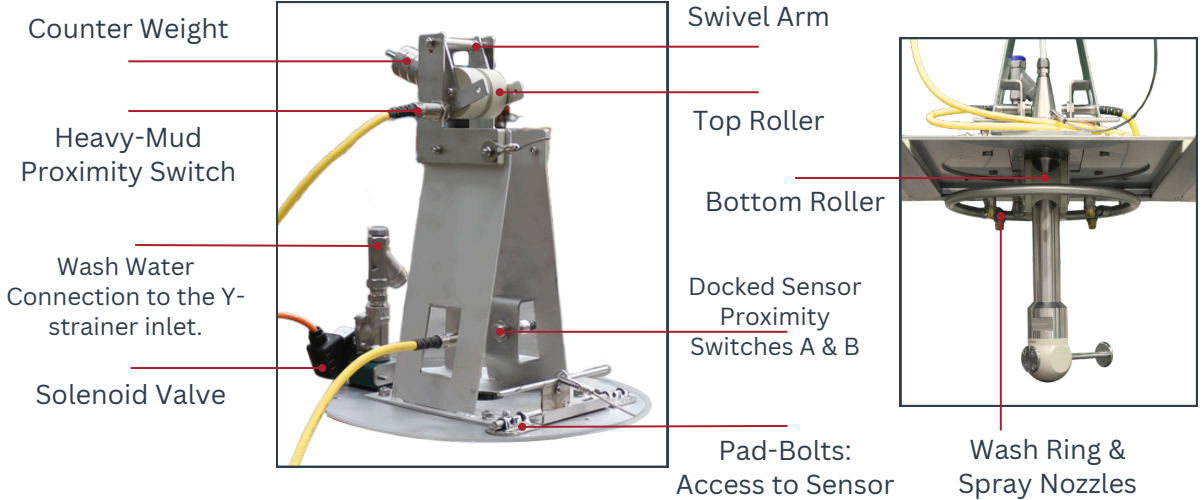
SMARTDIVER® COMPONENTS



SMARTDIVER[®] COMPONENTS



WASHBAY COMPONENTS



CONTROL PANEL

TOUCHSCREEN (HMI)

Adjust Settings
View Trends
View Alarms

EMERGENCY STOP

Safety quick stop
Removes power to the motor



ALARM RESET

Toggle the 2-position switch RUN-STOP-RUN* to reset Alarm

ALARM LIGHT

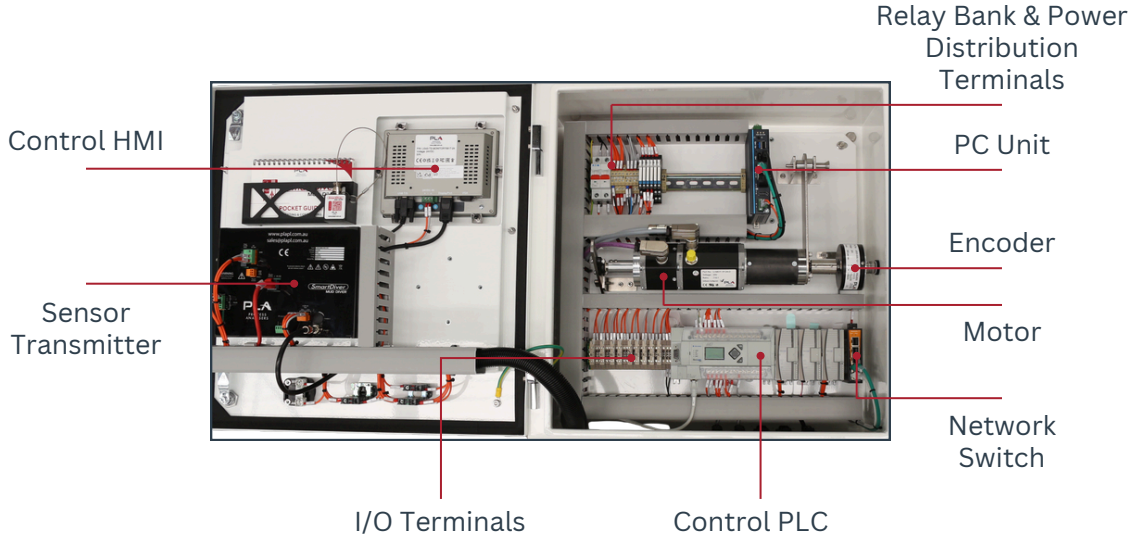
Indicates an Alarm

TWO POSITION SWITCH: RUN/STOP

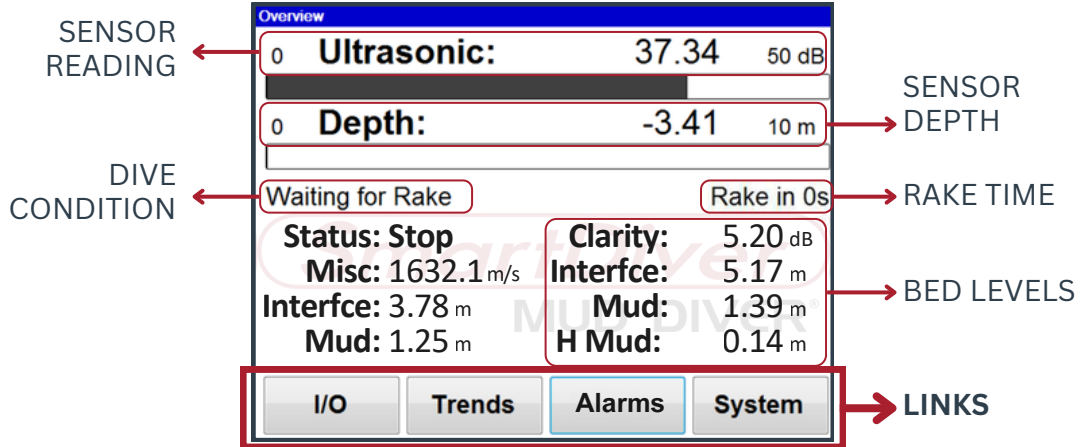
Automatic dive operations
Raise sensor to wash bay and put into STOP MODE

**May appear as START-STOP-START in some models*

ENCLOSURE COMPONENTS



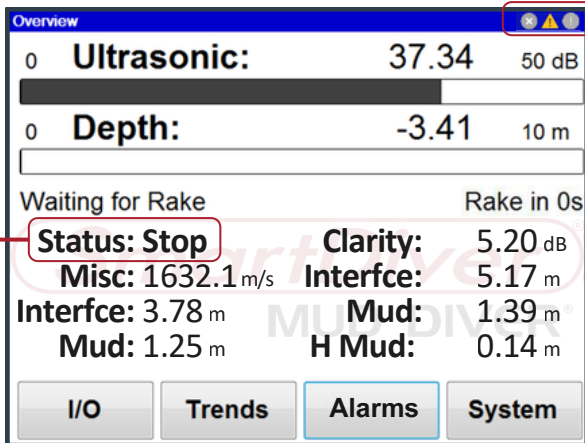
HMI - SCREEN OVERVIEW



HMI - SCREEN OVERVIEW

OPERATING STATUS:

- MANUAL
- STOP
- RUN
- WARNING (ALARM)
- FAULT (ALARM)
- PROCESS (ALARM)
- SYSTEM (ALARM)



ALARM NOTIFICATIONS:

- ✖ FAULT
- ⚠ WARNING
- ! PROCESS
- ! SYSTEM

I/O - SCREEN OVERVIEW

Overview

0 Ultrasonic: 37.34 50 dB

0 Depth: -3.41 10 m

Waiting for Rake Rake in Os

Status: Stop Clarity: 5.20 dB
Misc: 1632.1 m/s Interface: 5.17 m
Interface: 3.78 m Mud: 1.39 m
Mud: 1.25 m H Mud: 0.14 m

I/O Trends Alarms System

I/O Status

Outputs	Inputs
Drive Enable OFF	Docked Prox A OFF
Drive Reverse OFF	Docked Prox B OFF
Water Solenoid OFF	Local Start PB OFF
Fault Relay ON	Local Stop PB ON
Digital Output 4 OFF	Sensor Fault OFF
Brake Off OFF	Rake Switch OFF
Startup Siren OFF	Heavy Mud Switch OFF
<<	Emergency Stop ON

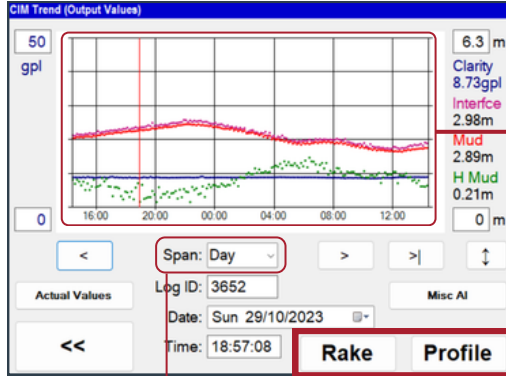
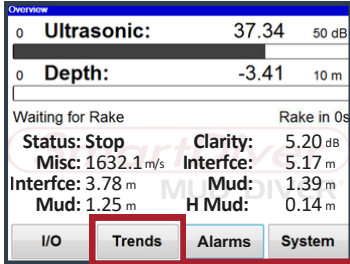
Extra Targets

BACK LINK:

To go back to the previous menu.

Appears on all windows.

HMI - TREND SCREEN



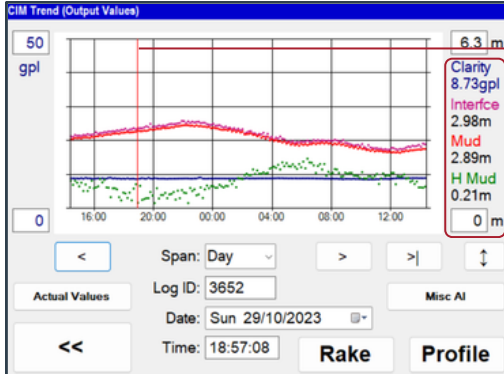
Each dot denotes an individual dive with a time stamp and log ID

LINKS

SPAN SELECTION:

WEEK, DAY, 5 HOURS, OR 1 HOUR

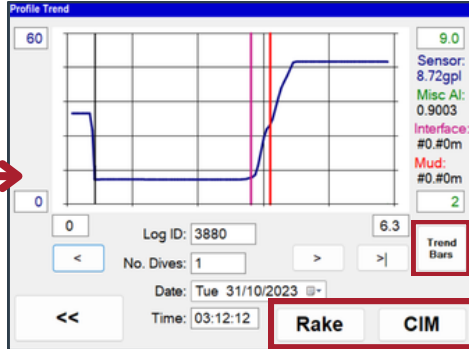
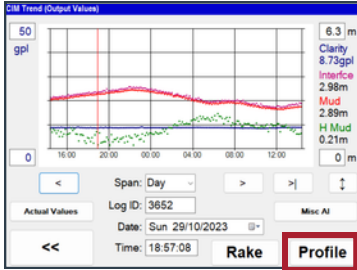
HMI - TREND SCREEN



To view specific values for any particular Dive:

- Tap any location on the Timeline
- A **RED** vertical line will appear at your selected point
- The corresponding values will be displayed in the panel on the right

HMI - PROFILE SCREEN



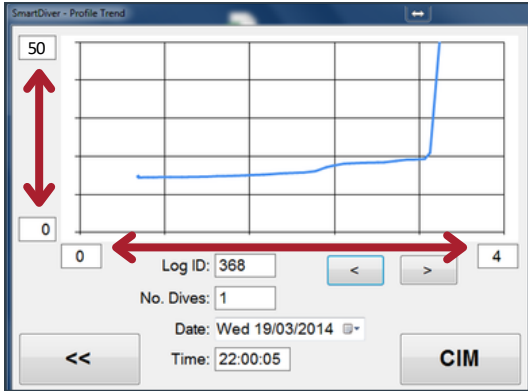
BLUE LINE:
SENSOR READING -
SOLIDS vs DEPTH

VERTICAL REFERENCE LINES
PINK: INTERFACE LEVEL
RED: MUD LEVEL

Toggles the visibility of
vertical reference lines on
the trend graph.
This helps identify the
Interface and Mud levels.

LINKS

DIVE PROFILE EXPLANATION - AXIS



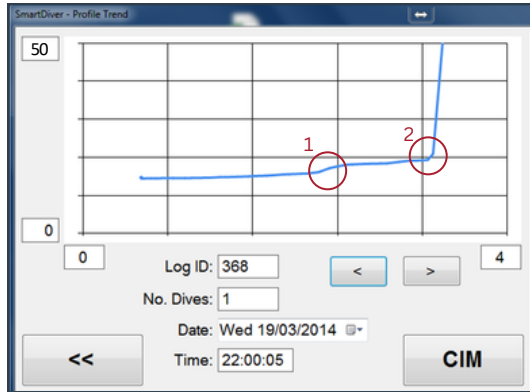
Y-AXIS (VERTICAL):

- Shows solids concentration measured by sound attenuation
- Range: 0 to 50 dB

X-AXIS (HORIZONTAL):

- Represents tank depth
- Starts at liquid level (0) on the left
- Increases in depth as you move right

DIVE PROFILE EXPLANATION



1. SMALL INCREASE
= **INTERFACE**

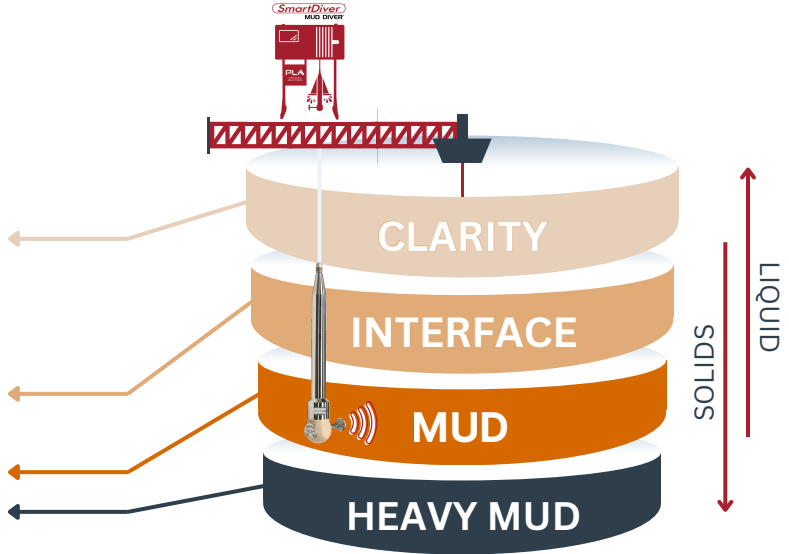
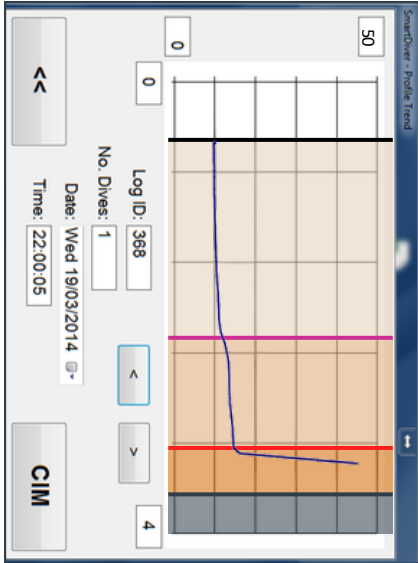
2. LARGE INCREASE
= **MUD**

ONE DIVE PROFILE
(Suspended solids vs Depth)



INCREASE IN SENSOR READING EQUATES TO AN INCREASE IN SUSPENDED SOLIDS CONCENTRATION

PROFILE ORIENTATION TO THE THICKENER



HMI - LOG IN ACCESS & SYSTEM PAGE

Overview

0 Ultrasonic: 37.34 50 dB

0 Depth: -3.41 10 m

Waiting for Rake Rake in 0s

Status: Stop Clarity: 5.20

Misc: 1632.1 m/s Interfice: 5.17

Interfice: 3.78 m Mud: 1.39

Mud: 1.25 m H Mud: 0.14

I/O Trends Alarms **System**

System

Login Save File Options Language

Log In 1. Data Log English

Config 2. Settings Rhosonics

Minimise Rake

Close

SN:
PLC: V4.79
TP: 1.224
C: 20.2GB Free
CMOS: 3.09V

<< Setup Manual Sys Log

Login

9786

0 to 9999 ####

7 8 9

4 5 6

1 2 3

0 . -

Ok Cancel Bksp

SYSTEM PAGE

System

Login Save File Options Language

Log Out 1. Data Log English

Config 2. Settings Rhosonics

Minimise Rake

Close

SN:
PLC: V4.79
TP: 1.224
C: 20.2GB Free
CMOS: 3.10V

<< Setup Manual Sys Log

! Log in code is **9786**

HMI – CONFIGURATION PAGE & SYSTEM LOGS

PLA SmartDiver
Configuration

PC Time: 26-Nov-2024 18:52:52 **Auto Set**

PLC Time: 26-Nov-2024 18:52:50 **Man Set**

PLC IP: 192.168.100.2

Serial #:

Name:

Database: C:\Data\SmartDiver.mdb

<<

CONFIGURE DEVICE SETTINGS

- PLC HMI Time adjustment
- PLC IP address
- Serial number ID
- Name of Site / Thickener
- Data file location

System

Log Out 1. Data Log English
2. Settings Rhosonics
Rake

Config

Minimise
Close

SN: V4.79
TP: 1.224
C: 20.2GB Free
CMOS: 3.10V

<< Setup Manual **Sys Log**

HMI & PLC
program versions
CMOS battery
voltage level.

PLA SmartDiver
Alarms Log

Date	Time	State	Fault
14/12/2023	13:19:12	ON	Clarity Threshold Warning
14/12/2023	13:17:49	OFF	Clarity Sensor Fault
14/12/2023	13:15:40	OFF	Possible Sensor Fail: HM Triggered Before Mud
14/12/2023	13:14:12	ON	Possible Sensor Fail: HM Triggered Before Mud
14/12/2023	13:11:53	ON	Both Prox Off In Wash Bay
13/12/2023	19:25:56	ON	Clarity Threshold Warning
13/12/2023	19:22:33	OFF	Clarity Threshold Warning
13/12/2023	19:20:42	OFF	Clarity Threshold Warning
13/12/2023	19:18:30	ON	Clarity Threshold Warning
13/12/2023	19:16:12	ON	Clarity Threshold Warning

Start Date: Mon 18/12/2023 Number of Days: Week

<< Desc Alarms

LIST OF SYSTEM DIAGNOSTIC LOG ENTRIES

HMI – SETUP PAGE

The screenshot shows the 'System' window on the left with the 'Setup' button highlighted. A red arrow points from this button to the 'Load Setup from USB' button in the 'Setup Data' window. The 'Setup Data' window displays the 'DIVE CONTROL' section with various parameters and their values.

DIVE CONTROL	
Pulses per Revolution	500
Drum Circumference	1.810 m
Cable Length	24.00 m
Liquid Height	3.00 m
Distance to Liquid	0.20 m
Creep Zone	0.10 m
Lower Speed	60 %
Raise Speed	99 %
Recovery Speed	40 %

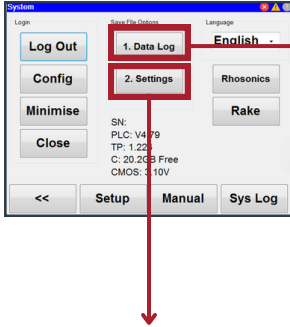
Load from .CSV File



The setup page has 5 segments.

1. Dive Control
2. Rake
3. Sensor
4. Alarms
5. Outputs

HMI – SAVING DATA LOG



DATA LOG:

All the historical dive records from this SmartDiver® will be saved to your USB memory stick.

This will save:

- Clarity, Interface and Mud (CIM) Trends
- Dive Profiles
- Fault Log Records


SETTINGS:


All the Settings from this SmartDiver® will be saved to your USB memory stick or your Computer's hard drive.


This will save:

- Settings Data from Setup Page

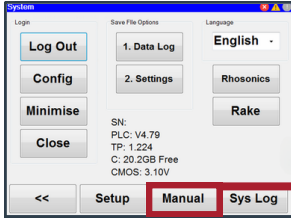
MANUAL OPERATION DISCLAIMER

-  **USE MANUAL MODE ONLY IF YOU WANT TO:**
 - CHANGE THE SENSOR FOR A NEW SENSOR
 - INSPECT / CLEAN THE SENSOR BY REMOVING IT FROM THE WASH BAY
 - WORK ON THE WASH BAY

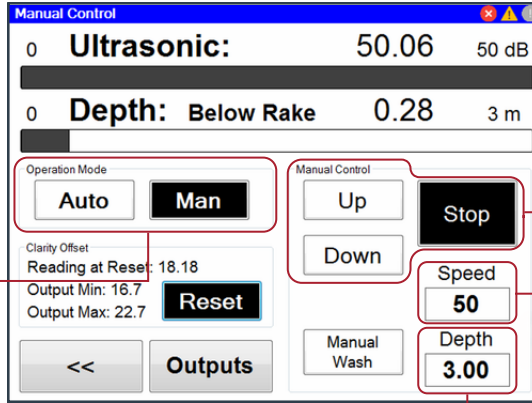
-  **WARNING: IN MANUAL MODE, SENSOR IS NOT SYNCHRONISED WITH THE RAKE AND RISKS COLLISION WITH RAKE DURING LOWERING.**

-  **WHEN SWITCHING FROM MANUAL TO AUTO MODE WITH THE 2-POSITION SWITCH IN RUN, THE DIVER MAY BEGIN A DIVE SEQUENCE IMMEDIATELY.**

HMI - MANUAL OPERATION



Toggles between
AUTO & MANUAL Mode



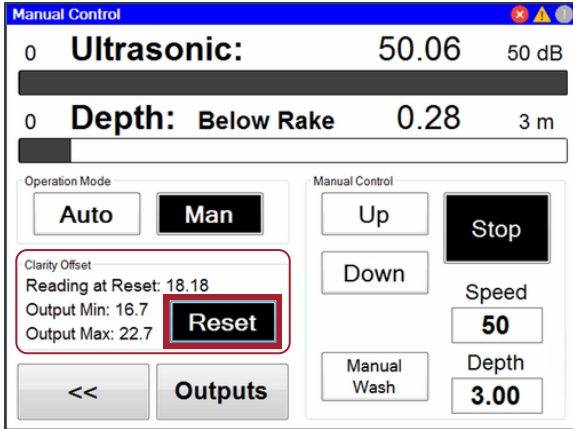
STOP/MOVE
SENSOR
MANUALLY

MOTOR SPEED:
FOR SENSOR ASCENT
& DESCENT

! SAFETY FEATURE - DEPTH LIMIT

IN MANUAL MODE, THE SENSOR STOPS AT THIS DEPTH & CANNOT GO LOWER.
ELIMINATES ACCIDENTAL SENSOR LOSS TO RAKE.

HMI - SENSOR CLEANING



⚠ The Sensor's readings can drift due to scale buildup.

Clarity offset corrects this while still reflecting short-term changes and flares in all bed-levels.

⚠ **CLARITY OFFSET NEEDS TO BE RESET AFTER CLEANING OR DESCALING THE SENSOR.**

HMI - ALARM SCREEN

Overview

0 Ultrasonic: 37.34 50 dB

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Misc: 1632.1 m/s Interf: 5.17
Interf: 3.78 m Mud: 1.39
Mud: 1.25 m H Mud: 0.14

I/O Trends Alarms System

Alarms

Up Down

236 00:01:04 PLC Time Does Not Match HMI Time
01 Jan 12

115 00:01:04 Emergency Stop
01 Jan 12

<< Alarm Reset Desc Log

Active Alarms
appear here

ALARM DESCRIPTION PAGE:

Lists all possible ALARMS
with their remedies

ALARMS LOG PAGE:

Lists all Closed/
Acknowledged ALARMS

Alarms Descriptions

Alarms Description and Remedy

Both Prox Off In Wash Bay

Description

At the end of the drive when the sensor is brought back into the wash bay, neither proximity switch has come on. This is a fault and will stop the SmartDiver® from running.

Remedy

Make sure the sensor is in the wash bay and the shaft of the sensor is between the proximity sensors.

Check the RED lights on the wash bay proximity sensors. If you cannot see the lights, Check the PLC Interlock and ensure both Inter 2 and 3 are ON when the sensors is in the bay.

<< Up Down

Alarms Log

Date	Time	State	Fault
14/12/2023	13:19:12	ON	Clarity Threshold Warning
14/12/2023	13:17:49	OFF	Clarity Sensor Fault
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13/12/2023	19:16:12	ON	Clarity Threshold Warning

Start Date: Mon 18/12/2023 Number of Days: Week

<< Desc Alarms

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