

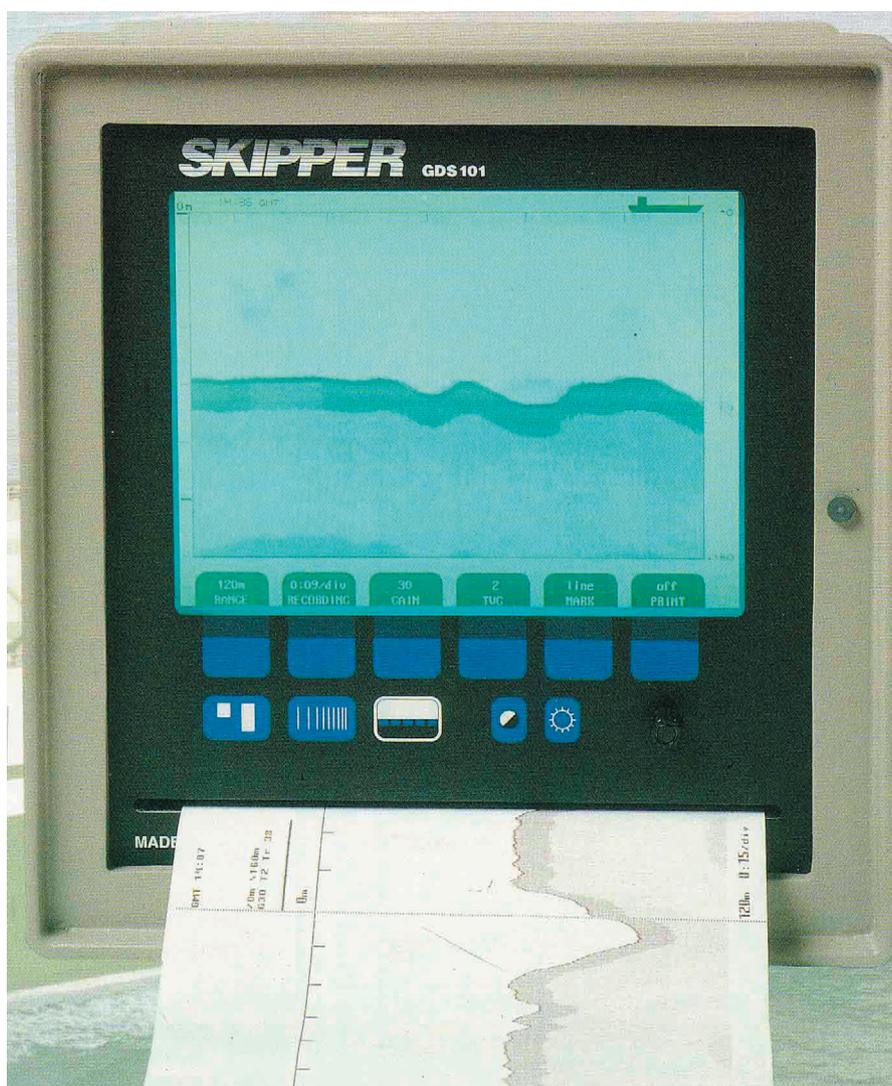
SKIPPER GDS 101

NAVIGATION ECHOSOUNDER

Operator`s Manual

Installation Manual

Edition 20030317sw3,5



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1. Introduction

System Summary.

GDS101 is a navigation sounder with a large, high resolution graphic LCD and a dot matrix thermal printer. The display graphics is continuously shown on the LCD along with complete navigation details, and the printer is available when a hard copy is required. All IMO requirements are met or exceeded. Comprehensive interfaces are available including NMEA0183 input and output.

Transducers.

GDS101 is prepared for connection of the following transducers: 38, 50 and 200 kHz. One or more of the transducers may be connected at the same time, and the desired transducer may be selected from the operator panel.

Operator Panel.

The operator unit contains a graphic dot-matrix supertwist LCD display, a thermal printer and a keyboard with fixed keys, soft-keys and a rotating encoder. The function of each soft-key button depends on the active screen, and the buttons are labelled on the lower rim of the LCD. The display is backlit, and contrast and backlight intensity may be adjusted by the user. The echo-gram is normally displayed continuously on the LCD and the printer is used if hard-copy documentation is required. The printer may be started automatically when a depth alarm is violated, or remotely from a manoeuvre recorder. The operator unit is normally flush mounted. Power supply options are 220V AC or 24V DC. The power consumption is appx. 70 Watts at 110/220V AC or 50 Watts at 24V DC.

Data Entry.

Several screens may be selected to enter various settings and calibration parameters. Each screen has a selection of soft-key buttons.

Screens 1 through 3 are primary operation screens with appropriate operator controls. Screens 4 through 10 are calibration set-up and system supervision screens.

The various screens will be described in detail later.

Printer.

The high resolution thermal printer uses continuous roll thermal sensitive paper for printing echo-grams and screen dumps. The roll contains appx. 15m paper. Since the printer is only required when hard copy documentation is absolutely necessary, the paper consumption is expected to be limited under normal conditions.

Fig. 1.1 shows the layout of a GDS101 Main Operator Panel.

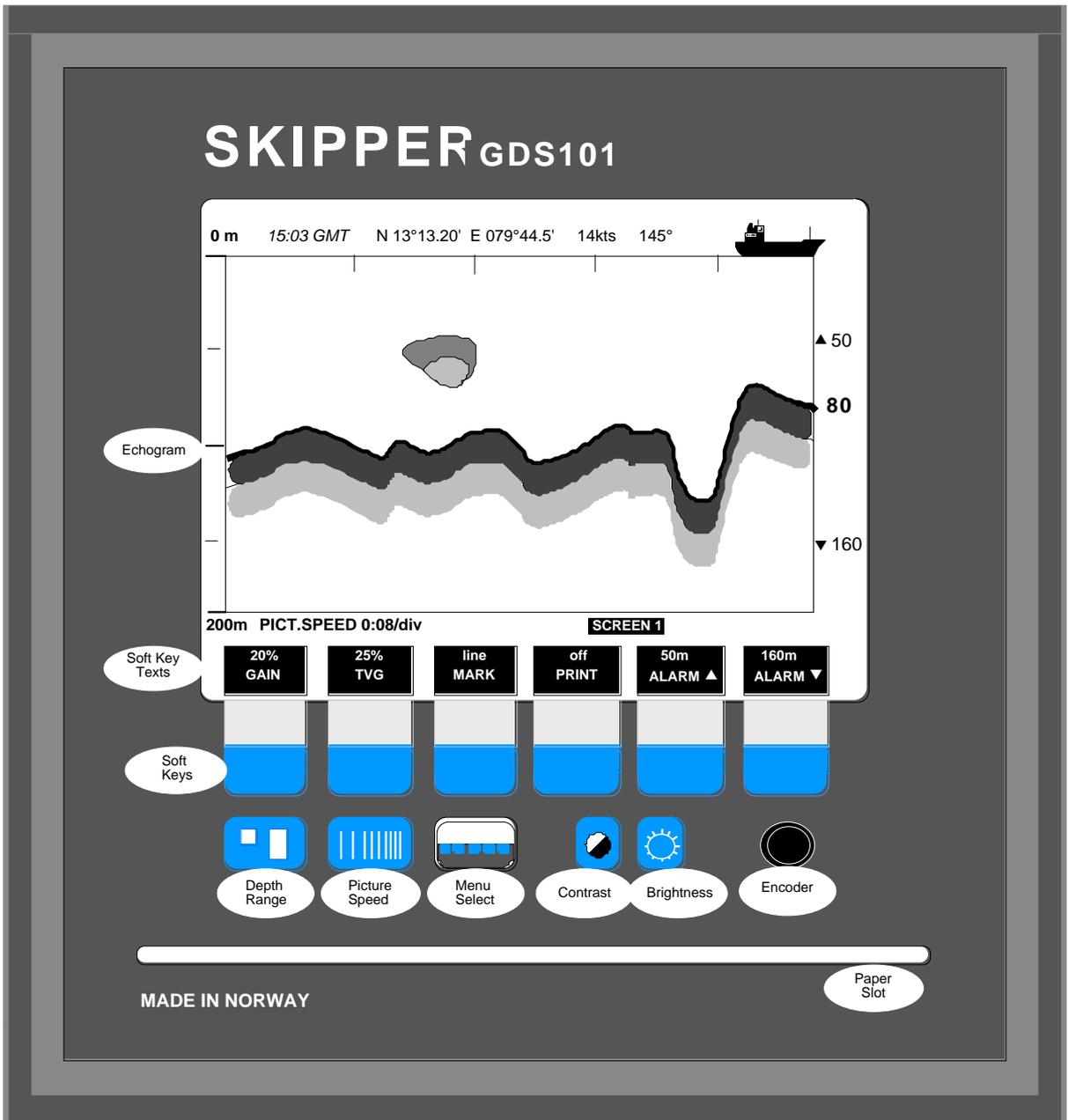


Fig. 1.1 Main Display Unit Panel Layout

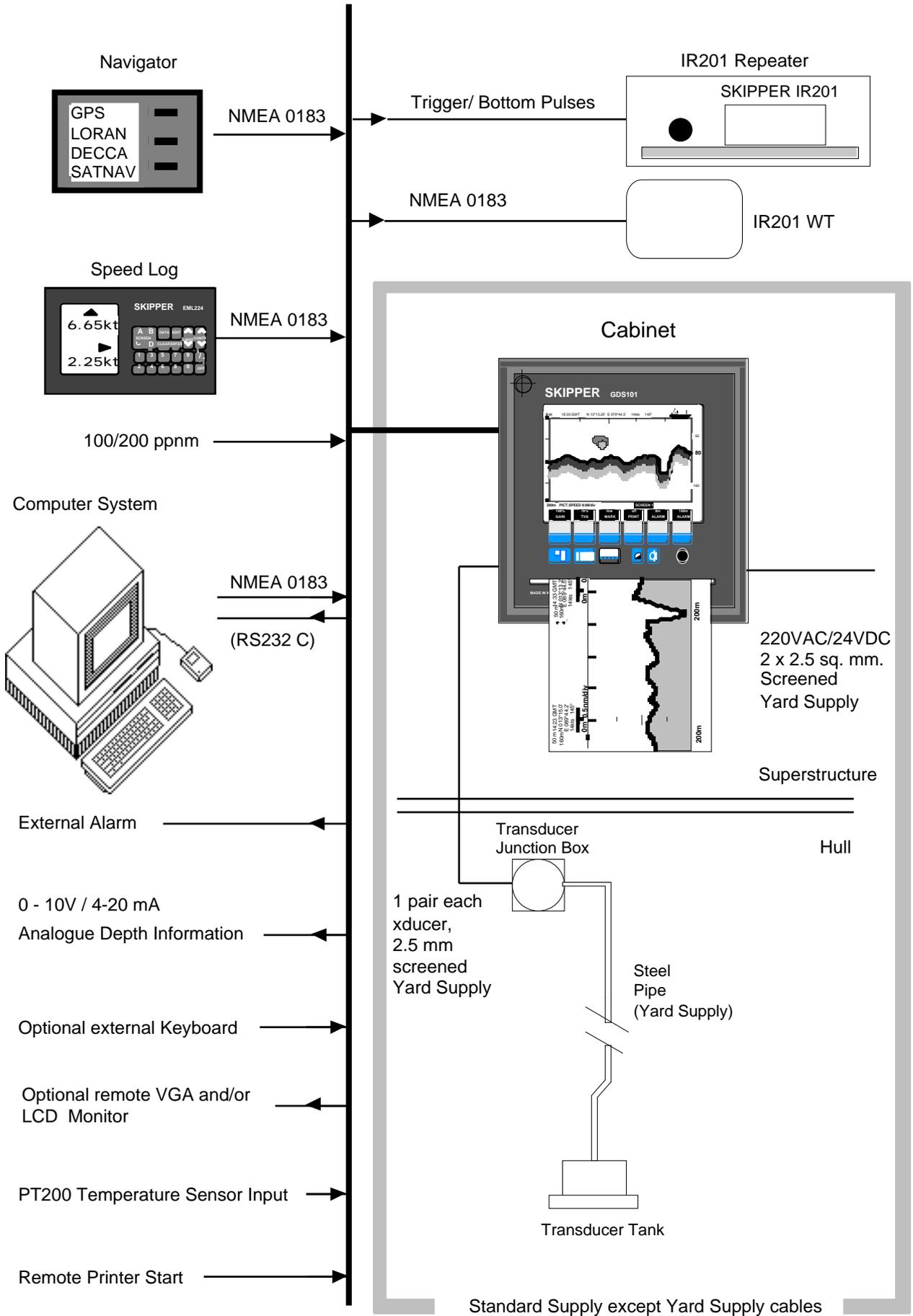


Fig. 1.2 System Diagram

Interfacing.

The GDS101 has various interface possibilities.

Outputs.

Transmitter and Bottom Pulse Outputs.
Analogue Output 0 - 10 V or 4 - 20 mA.
NMEA0183 Interface Output of Depth Information
External Alarm Relay Output.

Inputs

Log Input 100/200 Pulses per nautical Mile.
NMEA0183 Interface Input of Position, Heading, Speed, UTC.
Remote Control and Synchronisation of Transmitter.
Remote Start of Printer.

Alarms.

Shallow and deep alarms may be selected from Screen 1. A potential free relay contact is provided in GDS101 for interface to external alarm systems.

History Memory

GDS101 has a 30 minute history memory. Depth, time and all available navigation data are stored continuously so that the last 30 minutes of information is always available.

Options.

Repeaters.

Graphic CRT or LCD display or digital depth slave repeaters may be connected to the system. Along with the graphic display repeaters there may also be installed remote keyboards.

Dual Frequency Screen.

A special option enables two different frequencies to be operated and displayed simultaneously. The main application will be two transducers placed at different locations of the vessel to facilitate harbour operations or manoeuvres under other shallow conditions.

Remote Sounding Control.

This option lets the GDS101 being controlled remotely in synchronised, burst or single ping modes.

Auto Range

This option will automatically adjust the depth range to maintain the bottom contour within the middle half of the screen.

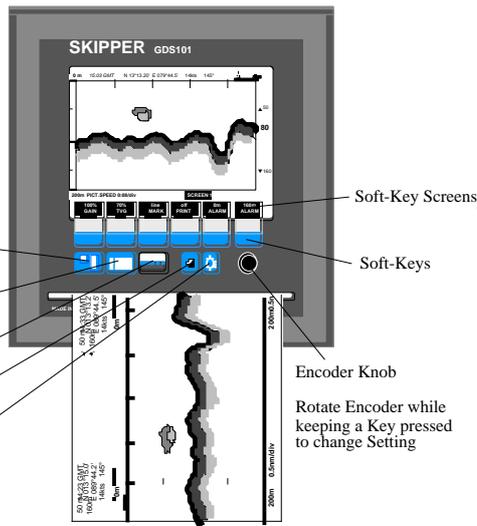
Sound Speed Calibration

This option will enable adjustment of the sound speed value used for the depth calculations.

GDS101 QUICK REFERENCE

Main Switches and Fuses inside Cabinet

- Depth Range Setting
- Display Speed Setting
- Menu Select button
- Screen Contrast
- Screen Backlight

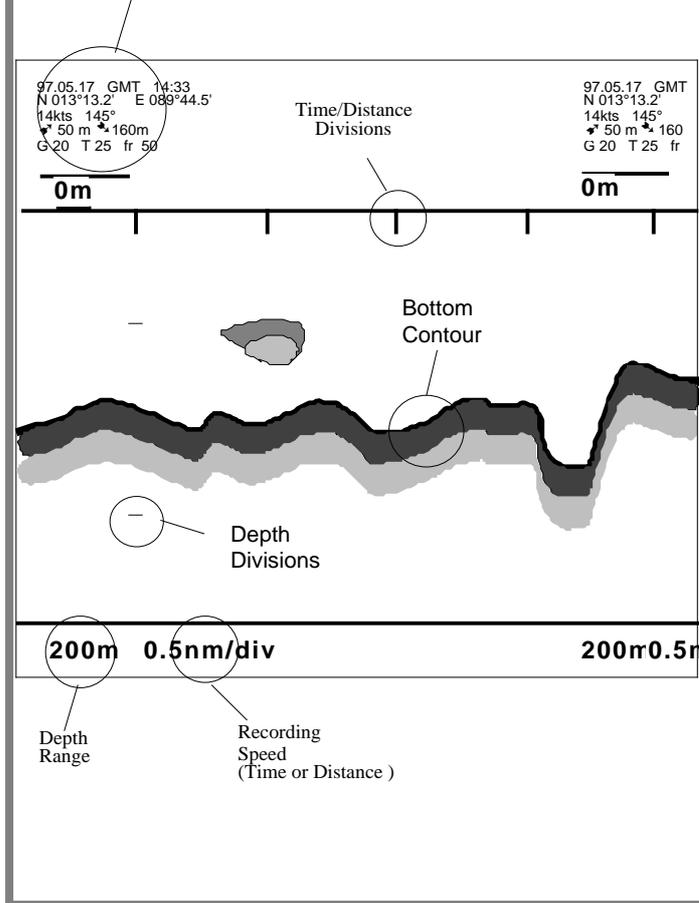


Press the Menu select Button repeatedly to cycle through the various "Soft-Key" Screens

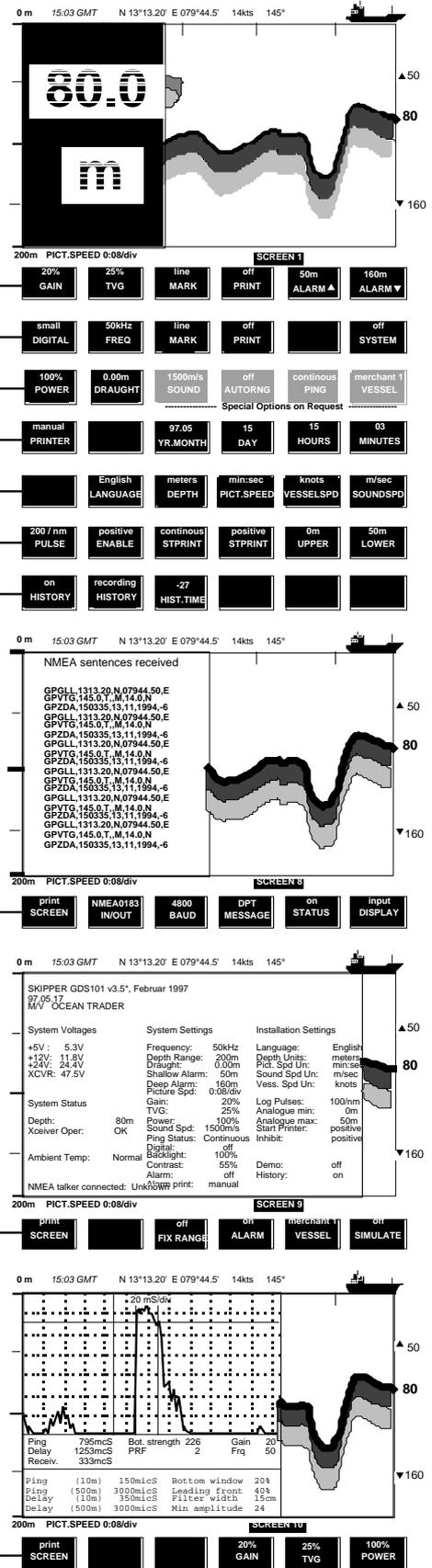
PRINTER RECORDING

Recording Annotation

<Date> <Time>
 <Position> (External)
 <Speed> <Heading> (External)
 G<ain> T<VG> F<requency>



SOFT-KEY SCREENS



GDS101 PRIMARY FUNCTIONS

0 m 15:03 GMT N 13°13.20' E 079°44.5' 14kts 145°

80.0
m

200m PICT.SPEED 0:08/div

SCREEN

20% GAIN	25% TVG	line MARK	off PRINT	50m ALARM ▲	160m ALARM ▼	Soft-Key Legend on Screen 1
Gain Adjustment 0% - 100% or Auto	TVG Adjustment 0% - 100%	Print Marker or Screen Dump	Printer Start / Stop	Shallow Alarm Setting	Deep Alarm Setting	

SCREEN

small DIGITAL	50kHz FREQ	line MARK	off PRINT		off SYSTEM	Soft-Key Legend on Screen 2
Large Depth Digits On / Off	Frequency Selection 38 / 50 / 200 kHz	Print Marker or Screen Dump	Printer Start / Stop		System Off On = Any Key (Main Switches and Fuses inside Cabinet)	

SCREEN

100% POWER	0.00m DRAUGHT					Soft-Key Legend on Screen 3
Power Adjustment 10% - 100%	Draught Setting					

Soft-Key Function Buttons

						Fixed-Key Functions
Depth Range Setting.	Display Speed Setting	Menu Select Button Press the Menu Select Button repeatedly to cycle through the primary "Soft-Key" Screens	Screen Contrast	Screen Backlight	Encoder Knob Rotate Encoder while keeping a Key pressed to change Setting or Menu	

2. Operation

When the installation is complete, and power is connected to the Operator Unit, the system is switched on by pressing any button. The unit is switched off by pressing the "SYSTEM off" soft key button on Screen 2.

Parameter entry

The fixed function buttons and the soft key buttons of the various screens along with the rotating encoder, facilitates entry of parameters, setpoints and other data. The following flow chart illustrates the procedure for changing settings and entering data. The various screens are shown in detail in the Operation Section.

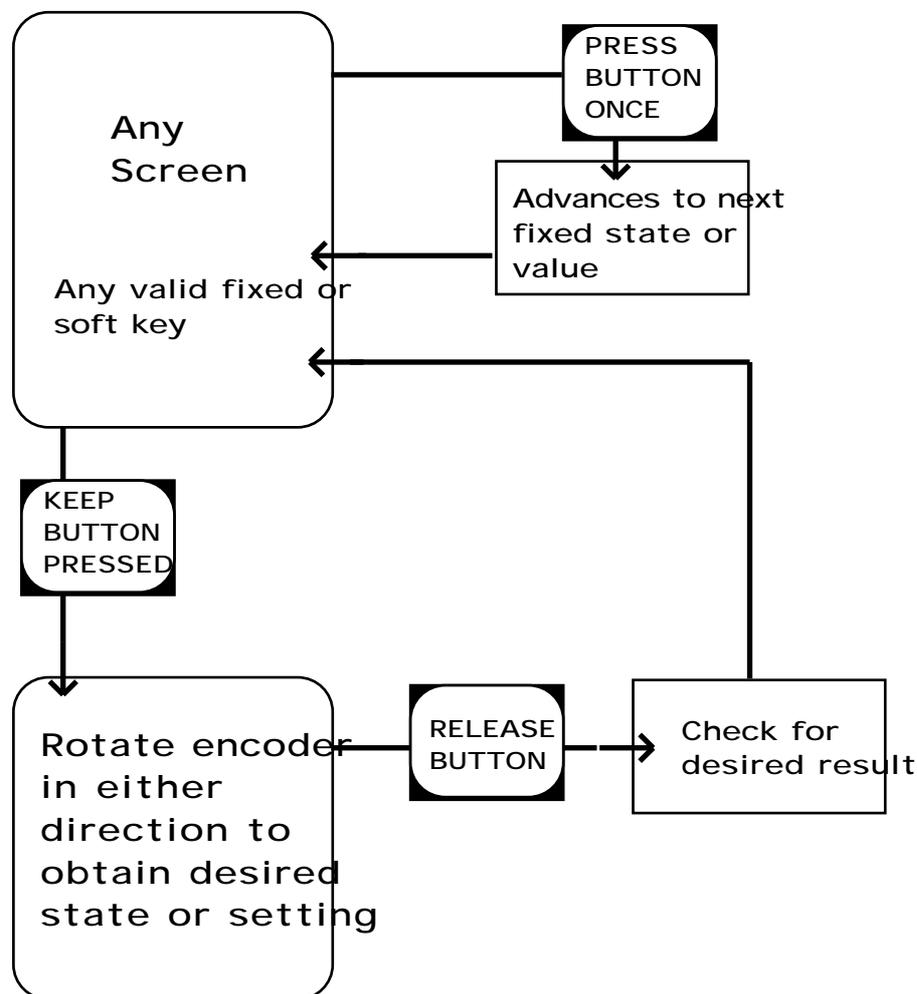


Fig. 2.1 Setting and Parameter Entry Flowchart

Example of parameter entry.

Let us say you want to enter a value of **800 m** for the depth range.

Press the Depth Range button several times and observe the depth range sequencing through the standard values 50, 100, 500, 1000 m. Press till the range is 500 m. Then press the Range button again and keep it pressed while you turn the encoder clockwise. Observe the depth range increase to 800 m, let go of the encoder and release the depth range button. You could also have started from the standard value 1000 m and decreased to 800 m by turning the encoder counter-clockwise.

Buttons with less than 6 possible states or values can be operated without using the encoder at all.

Operation Screens

Each of the operation screens contains a graphic picture and a selection of up to 6 soft key buttons. The various screens are selected by keeping the "Menu" button pressed and rotating the encoder in either direction. Turning the encoder clockwise cycle the screens in the sequence 1 to 10, and counter clockwise rotation cycles the screens in the sequence 10 - 1. Screens no. 1 - 3, covering the primary functions, may also be cycled by repeatedly pressing the "Menu" button.

The screen layouts are outlined in Fig. 2.2 through 2.11. The various Soft Key button functions are described with each screen.

Primary operation Screens.

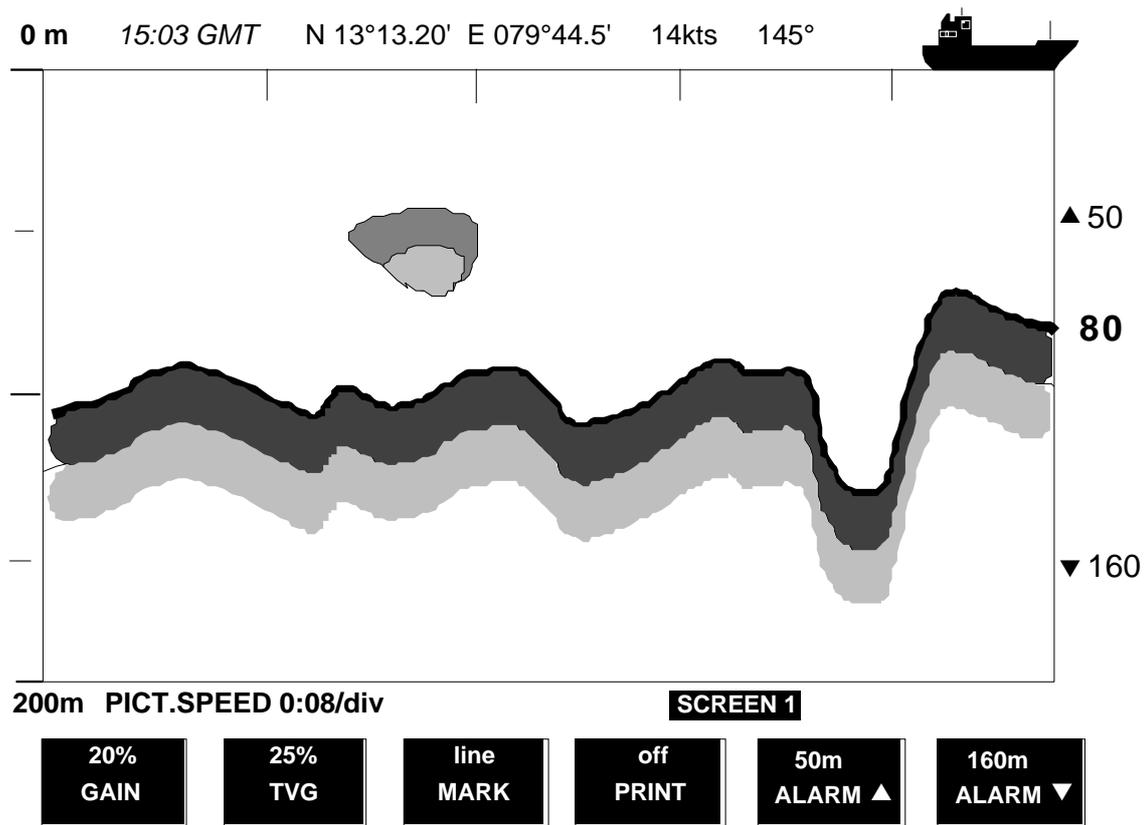


Fig. 2.2 **Screen 1, Primary Operation screen.**

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	GAIN	0 - 100%	Gain Adjustment.
Soft Key 2	TVG	0 - 100%	Time Variable Gain Adjustment.
Soft Key 3	MARK	line	Print mark line/Dump screen.
Soft Key 4	PRINT	on/off	Start and stop of continuous printing.
Soft Key 5	ALARM	0 - 100m	Shallow Alarm adjustment.
Soft Key 6	ALARM	0 - 200m	Deep Alarm adjustment.

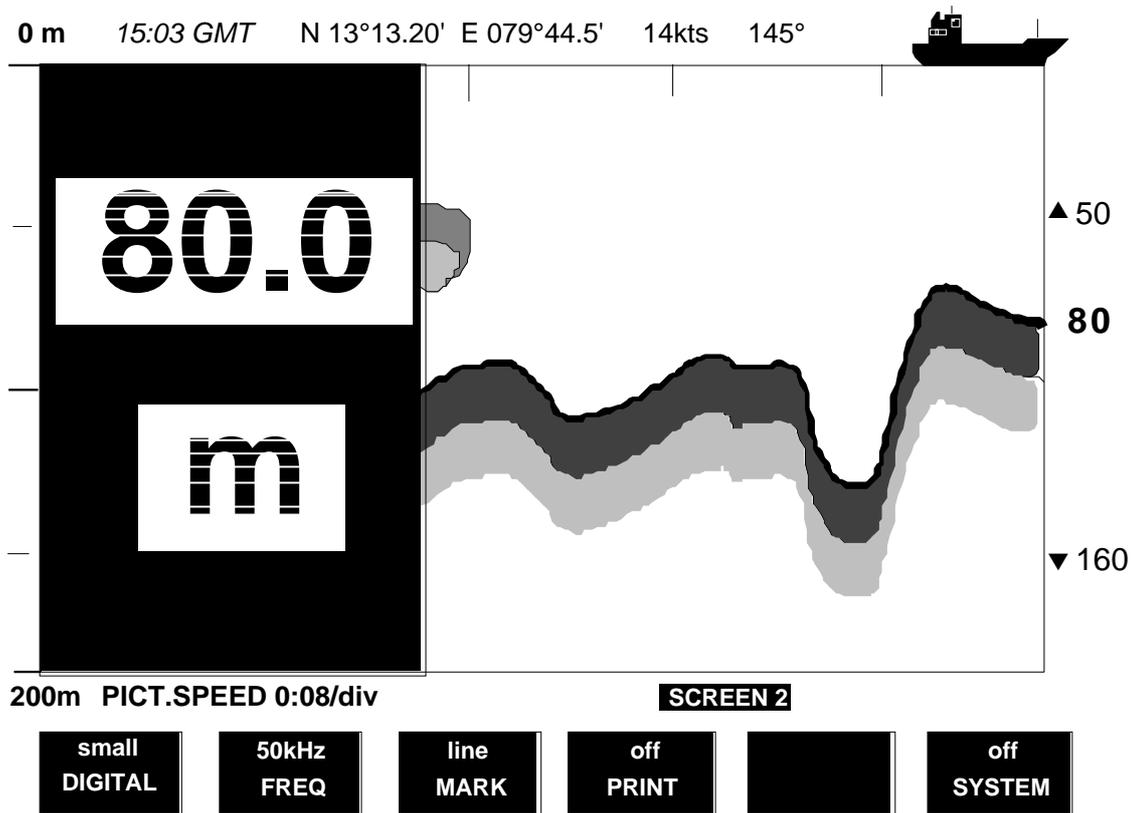


Fig. 2.3 **Screen 2, 2nd Operation screen.**

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	DIGITAL	off/small/large	Control of digital depth indication.
Soft Key 2	FREQUENCY	38/50/200/(<i>dual</i>)	Transducer selection.
Soft Key 3	MARK	line	Print mark line/Dump screen.
Soft Key 4	PRINT	on/off	Start and stop of continuous printing.
Soft Key 5	not used.		
Soft Key 6	SYSTEM	off	Switch off System.

Note. *Dual Frequency is an option.*

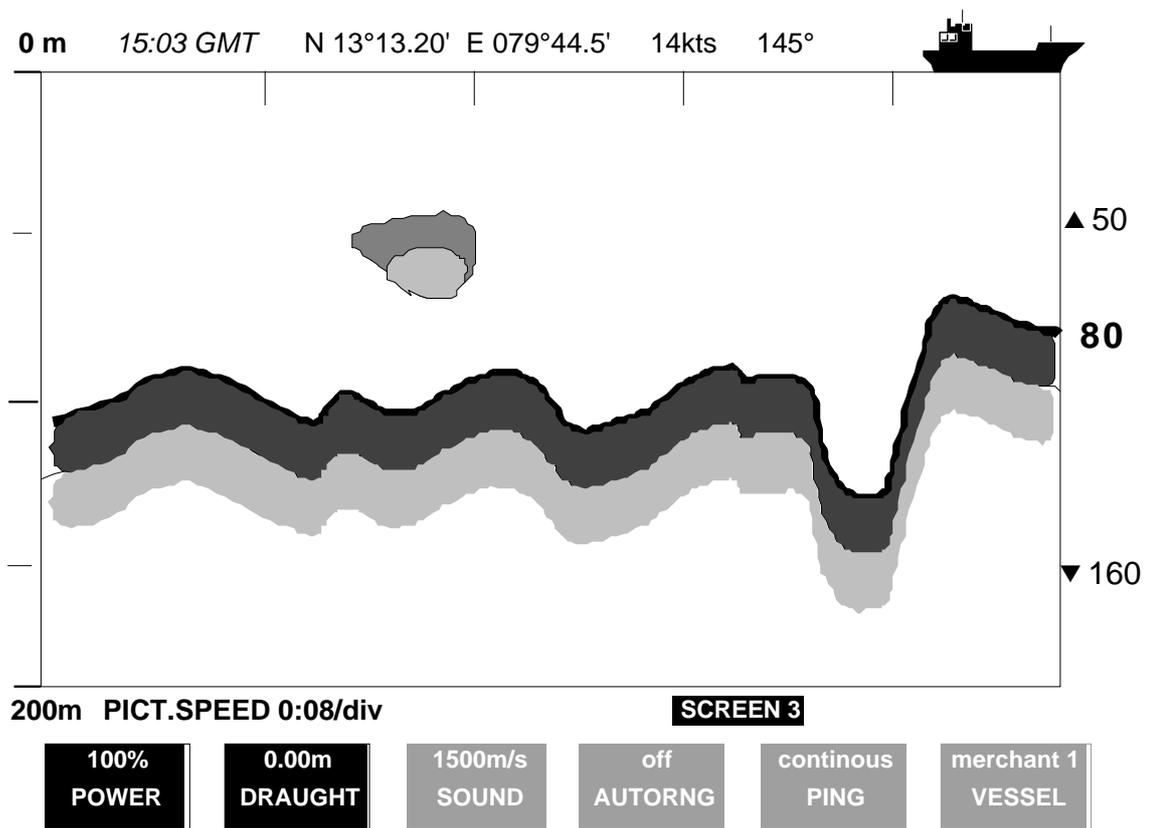


Fig. 2.4 Screen 3, 3rd Operation screen.

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	POWER	0 - 100%	Transmitter power adjustment.
Soft Key 2	DRAUGHT	-100 - 100m	Draught correction
Soft Key 3	SOUND	1400 - 1550m/s	Sound speed setting.
Soft Key 4	AUTORANGE	on/off	Auto Range control.
Soft Key 5	PING	continous/single/edge	Ping control.
Soft Key 6	VESSEL	merchant1/2, Navy1/2	Upper right screen icon selection.

Note. Soft Keys 3 through 6 control optional functions.

Secondary operation screens.

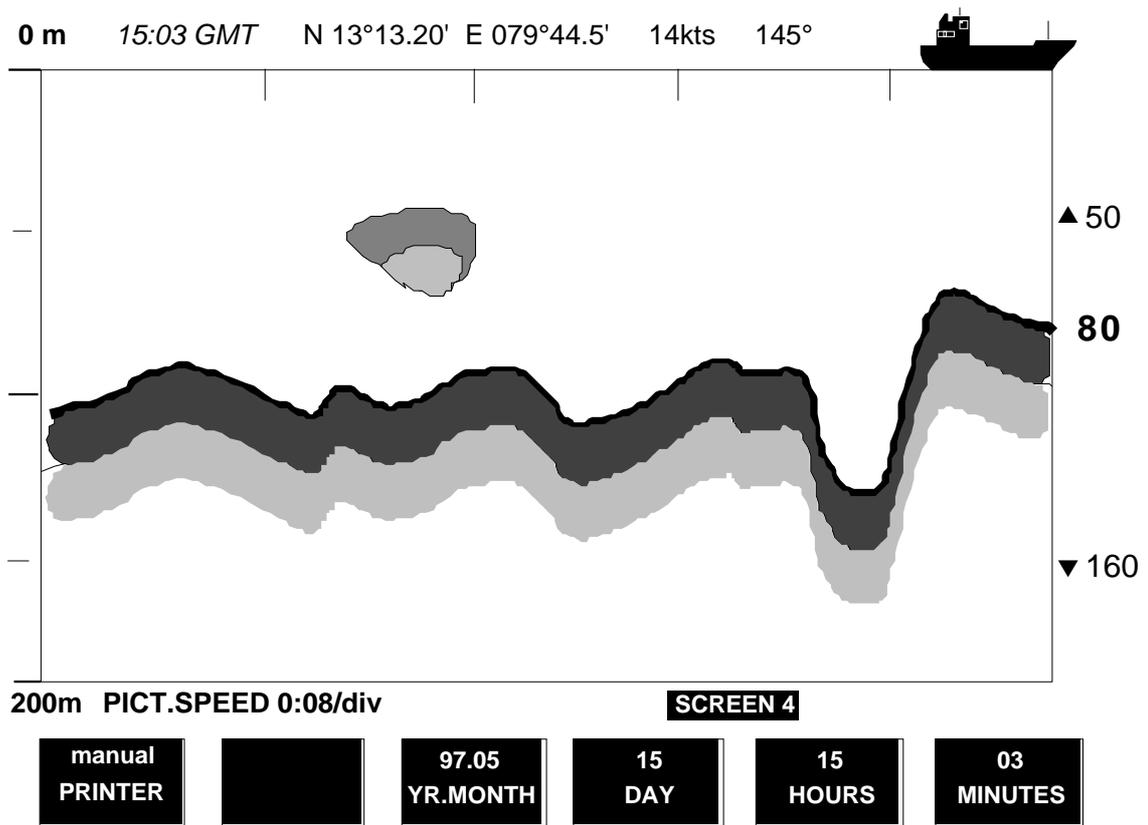


Fig. 2.5 Screen 4, Calendar and clock setting.

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	PRINTER	manual/auto	Printer start options.
Soft Key 2	not used		
Soft Key 3	YEAR.MONTH	97.01 ->	Calendar setting.
Soft Key 4	DAY	1 - 31	Calendar setting.
Soft Key 5	HOURS	0 - 23	Real time clock setting.
Soft Key 6	MINUTES	0 - 59	Real time clock setting.

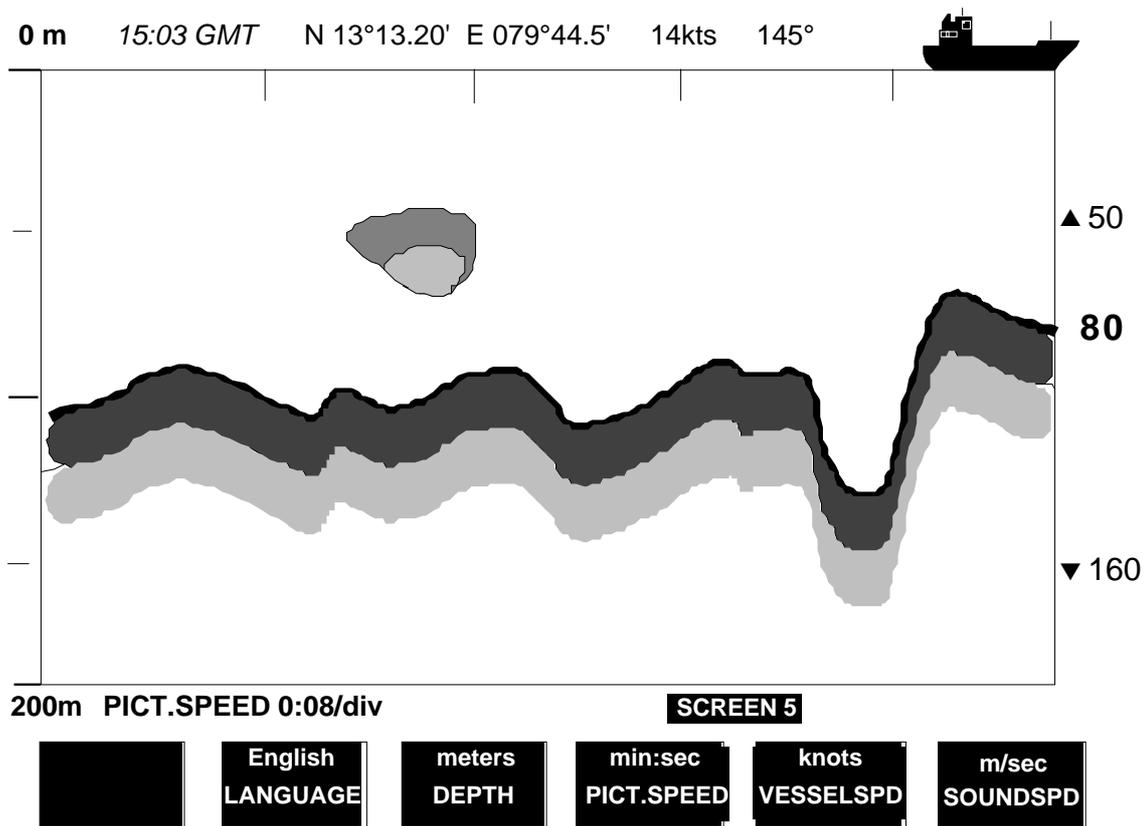


Fig. 2.6 Screen 5, Language and units of measure Setup.

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	not used.		
Soft Key 2	LANGUAGE	English etc.	Screen language selection.
Soft Key 3	DEPTH	m etc.	Unit of measurement for depth.
Soft Key 4	PICT.SPEED	m:s/div etc.	Unit of measurement for picture speed.
Soft Key 5	VESSEL SPEED	knots etc.	Unit of measurement for vessel speed.
Soft Key 6	SOUND SPEED	m/s etc.	Unit of measurement for sound speed.

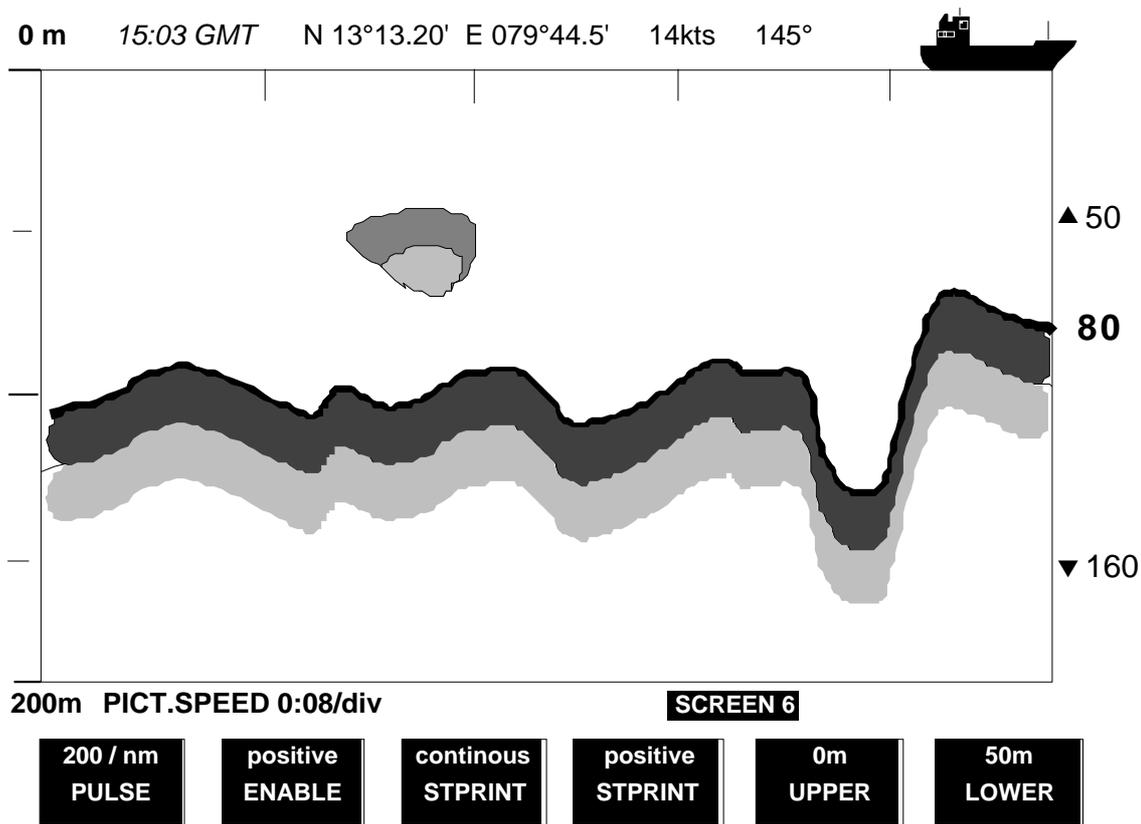


Fig. 2.7 **Screen 6, Interface Setup screen.**

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	PULSE	100/200	Log pulse input calibration.
Soft Key 2	ENABLE	pos/neg	External enable polarity select
Soft Key 3	ST.PRINT	continuous/edge/level	External printer start mode
Soft Key 4	ST.PRINT	pos/neg	External printer start polarity.
Soft Key 5	UPPER	0 - 98m	Analogue output shallow limit = 0V.
Soft Key 6	LOWER	0 - 99m	Analogue output deep limit = 10V.

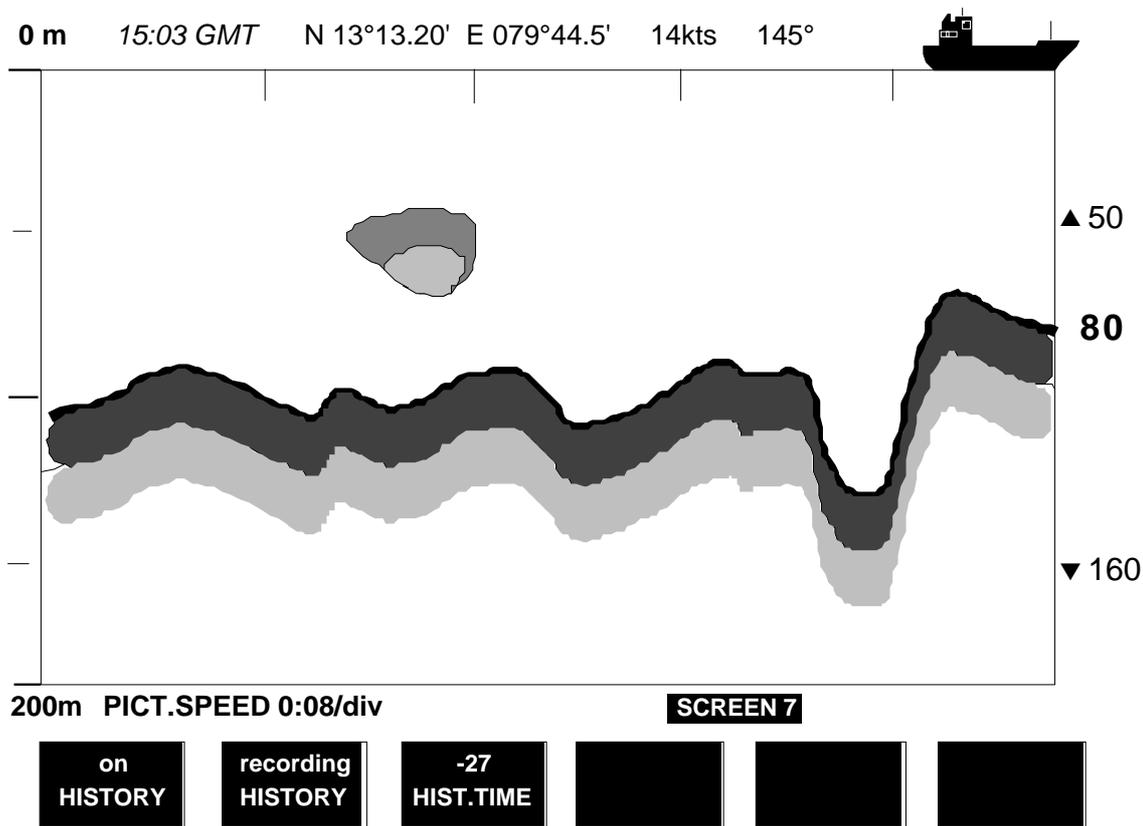


Fig. 2.8 **Screen 7, History Memory Control Screen.**

This screen shows the main graphic echo-gram. Left hand digital indication may be enabled from screen 2.

Soft Key 1.	HISTORY	on/off	Start/stop(keep) History Operation.
Soft Key 2	HISTORY	Record/Playback	Record/Playback of History.
Soft Key 3	HIST.TIME	-27 - 0 min	History Playback Spooling.
Soft Key 4	not used.		
Soft Key 5	not used.		
Soft Key 6	not used.		

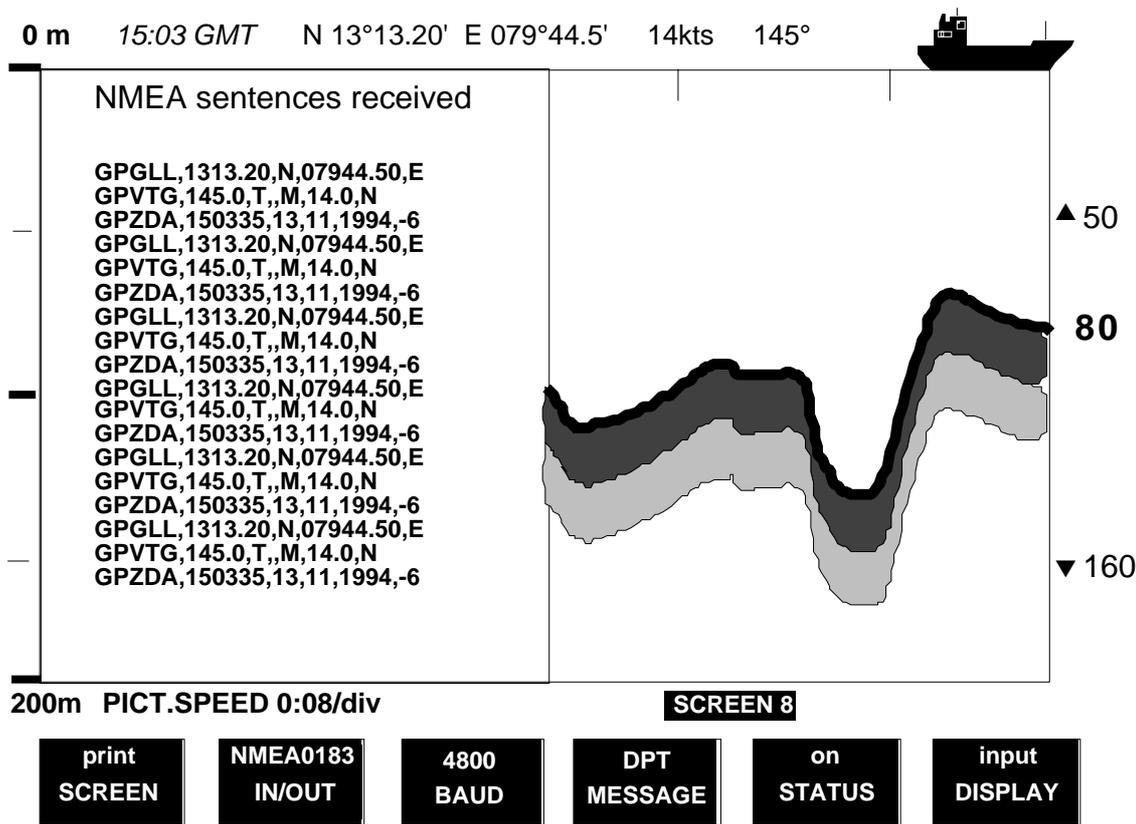


Fig. 2.9 Screen 8, NMEA Control Screen.

This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1.	PRINT	screen	Print Screen.
Soft Key 2	IN/OUT	NMEA0183/RS232	I/O Port Selection
Soft Key 3	BAUD	4800/9600	NMEA Baud Rate Selection
Soft Key 4	MESSAGE	DPT/DBS/DBT/DBK/ EN250	Xmitted Message Selection.
Soft Key 5	STATUS	on/off	Xmitted Message Status.
Soft Key 6	DISPLAY	off/input/output	Message display Operation.

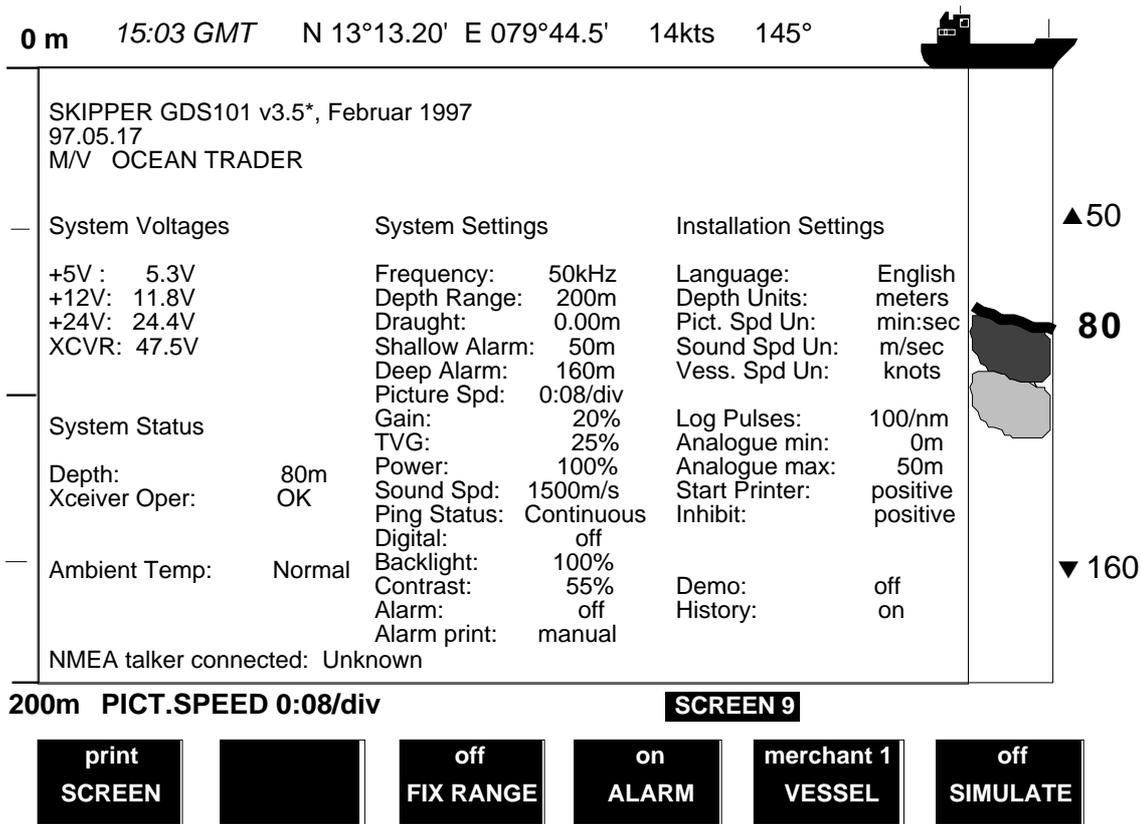


Fig. 2.10 Screen 9, System Status Screen.

This screen shows a comprehensive list of system settings and parameters.

Soft Key 1.	PRINT	screen	Print screen.
Soft Key 2	not used		
Soft Key 3	FIX RANGE	on/off	Limit Search Range to Window
Soft Key 4	ALARM	on/off	Internal Alarm Buzzer Control.
Soft Key 5	VESSEL	merchant1/2, Navy1/2	Upper right Screen Icon Selection.
Soft Key 6	SIMULATE	on/off	Built-in Simulator Control.

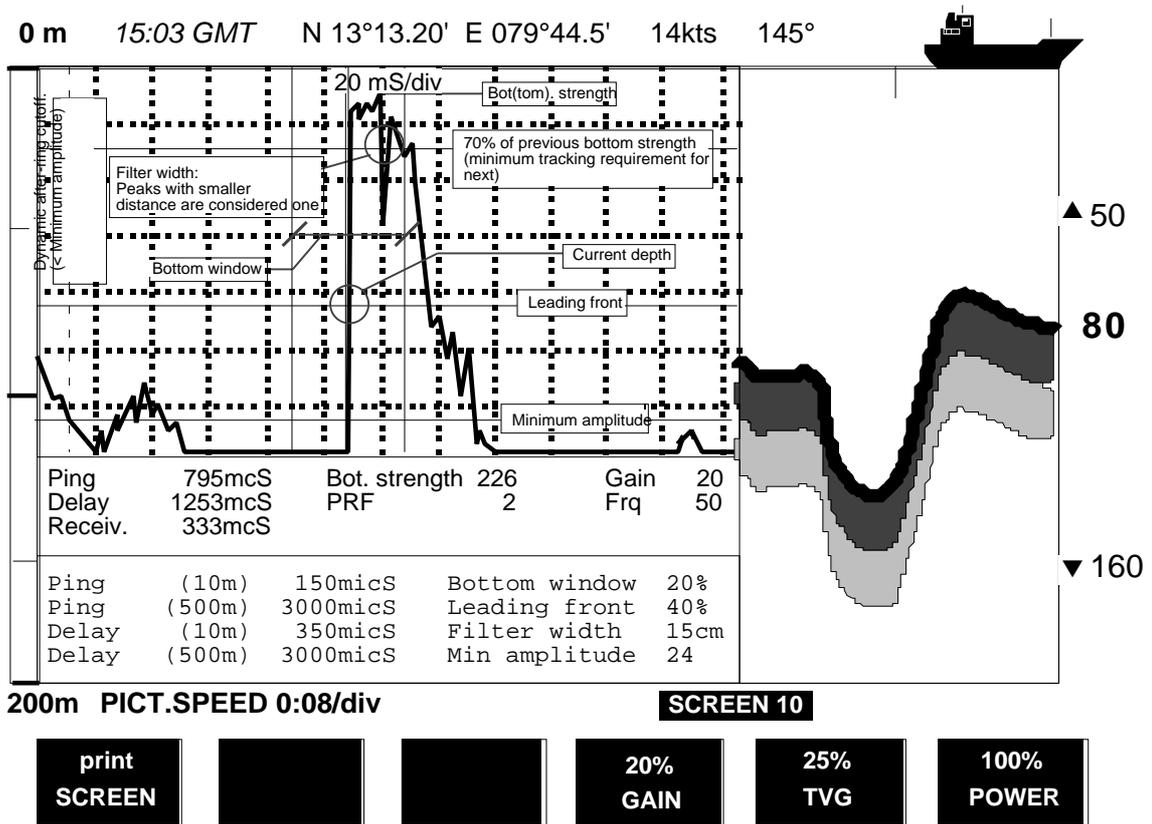


Fig. 2.11 Screen 10, Oscilloscope Screen.

This screen shows oscillogram of receiver output versus time and half screen echo-gram.

Soft Key 1.	PRINT	screen	Print screen.
Soft Key 2	not used		
Soft Key 3	not used		
Soft Key 4.	GAIN	0 - 100%	Gain Adjustment.
Soft Key 5	TVG	0 - 100%	Time Variable Gain Adjustment.
Soft Key 6	POWER	0 - 100%	Transmitter power adjustment.

Principal Functions

Bottom detection

GDS101 employ a bottom detection algorithm that will try to extract the bottom signal from all kinds of noise and secondary echoes. When GDS101 is tracking the bottom normally, a thick black line is shown, and below that, a ribbon with a hatched pattern. This pattern has two levels of hatching. The darkest represent strong and unambiguous bottom echoes. The lighter hatching represents weaker signals possibly occasional detection misses. If the software can detect no bottom for several pings, the hatched ribbon disappears.

During normal bottom tracking, a digital value is shown by the bottom contour at the right side of the screen. If the software algorithm loses track of the bottom altogether, a warning beep is heard and the black line and hatching band disappears. A warning message: "Lost bottom" is shown in the screen's lower right corner.

Ping to Ping filtering

Part of the bottom detection algorithm is the ping to ping filtering. The next bottom is searched for in a time and strength window based on the strength and timing of the previous bottom echoes. This procedure reduces the probability of tracking schools of fish or secondary echoes as bottom.

If no bottom is detected in the calculated window, the window is gradually increased in size until the full time and strength window is used.

Bottom Search Range

The FIX RANGE function in Screen 9 is used to control the search range for the bottom detection algorithm. When this function is on, bottom is only searched for within the selected display range. When the function is off, bottom is searched for within the entire functional range of the echo sounder.

Power ON/OFF

During normal daily operation, the system may be switched off from Screen 2. This operation does not disconnect the system from the power supply, but all power consuming components are switched off. The system may be switched on again by pressing any button.

Do not run the sounder for a long time without a submerged transducer connected.

Alarm acknowledgement.

When the depth alarm is activated, the alarm may be acknowledged by pressing any button.

Fixed Key Functions.

Depth Range

The Depth Range button can be used to set the depth limit between 10 and 1600 m. Standard values available by repeatedly pressing the button are 50, 100, 500 and 1000 m.

Picture Speed

Picture speed may be referred to either time or speed. If no speed log is connected, Picture Speed will always be referred to time. ("mm:ss/div").

If a speed log is connected, it is possible to select a "speed/div" unit in Screen 5.

The ping-rate range depends on the Depth Range, and the fastest ping rate at shallow depths is about 5 pings per second.

Menu

The menu button facilitates selection of one of the 10 screen and soft key layouts. The 3 primary operation screens may be cycled by repeatedly pressing the MENU button. Access to the remaining screens is through encoder operation. The screens are cycled in an endless, bi-directional loop, e.g. turning the encoder counter-clockwise, will open Screen 10 after Screen 1.

Turning the encoder with no buttons pressed always force Screen 1.

Contrast & Backlight adjustment

Contrast and backlight may be continuously controlled by means of the appropriate buttons and the encoder. Press either button and rotate the encoder until a satisfactory setting is obtained, then release the button. The settings are maintained in the non-volatile memory, and the last settings are restored on power up.

It is also possible to cycle through 4 standard backlight/picture settings by repeatedly pressing the brightness button. The 4 settings are:

1. Full backlight, normal screen picture
2. Half backlight, normal screen picture
3. Full backlight, inverted screen picture
4. Half backlight, inverted screen picture

If the backlight setting is reduced too much, the panel illumination may become uneven due to the CCT tubes not being properly ignited. Increase the setting until the illumination is even across the screen.

Soft Key Functions.

Gain

Gain may be adjusted from 0 to 100% to allow for optimal echo levels from bottom and other objects. The GAIN setting affects signals from all depths.

TVG

Time Variable Gain may be adjusted from 0 to 100 % to allow for detailed echo control from the 0 - 50 m depth range.

A low setting will reduce the gain in the area near the surface to suppress noise and unwanted echoes from this area.

Digital indication

On the operation screens, two sizes of large digital depth indicators may be selected from Screen 2.

"Small" digits occupy approximately 40% of the net echo-gram screen width.

"Large" digits occupy approximately 55% of the net echo-gram screen width.

Frequency

The Frequency selector toggles among 38, 50 and 200 kHz. On systems with the Dual Screen option installed, 50 and 200 kHz may be selected simultaneously (Dual) and signals from both transducers are shown on a split screen or printout.

Output Power

Power may be adjusted from 10 to 100 % in case of difficult shallow water conditions. Too high power in such cases will possibly saturate the receiver or cause detection of unwanted secondary bottom or surface echoes.

When a range of 10m is selected, Output Power is automatically limited to 10%.

Draught

Draught may be compensated to allow real depth from surface to be shown on the screen and printout. Negative draught values may be entered to compensate for transducers fitted above the keel.

This setting also affects the NMEA transmitted values.

Draught compensation is indicated on the screen by a flashing number to alert the operator to the fact that the shown depth value is adjusted.

Printer Operation

The printer is started and stopped by the **Print** buttons. The printer may be used for continuous printing over a period of time or the current screen contents may be dumped to the printer for reference if something interesting is observed.

The **Print** buttons switch continuous printing on and off.

The **Mark** buttons will write a line mark on the paper if it is pressed whenever the printer is running.

If the **Mark** button is pressed when the printer is off, this will initiate a screen dump of the present screen contents.

Alarm settings

Depth alarm settings are performed from Screen 1. Alarm limits are referred to the indicated depth.

The local alarm buzzer may be disabled from screen 9, but the external alarm relay will always operate. The only way to disable the alarms completely, is to reduce the shallow alarm to zero depth and increase the deep alarm to maximum range.

An active shallow alarm limit must be less than an active deep alarm limit. Alarm limits are enforced with hysteresis.

A depth alarm may automatically start the printer if this function is enabled on Screen 4.

Clock and Calendar Settings

Manual Clock and Calendar adjustments are carried out in Screen 4. If a Satellite navigator giving UTC messages is connected to the NMEA input, the clock and calendar will be automatically updated and manual adjustment is not required.

History Memory

GDS101 has a 30 minute history memory. Depth, time and all available navigation data are stored continuously so that the last 30 minutes of information is always available. The history memory is controlled from Screen 7.

The normal history modes are "on" and "recording". New depth information is continuously stored in the memory while the oldest samples are discarded. Only bottom information is stored along with time and whatever navigational information is available in the GDS101 (Position, Speed, Heading).

By switching history "off", the stored 30 minutes will be kept in the memory and no new samples will be written. As a warning that the memory is not recording, "History off" is flashing at the bottom of the screen.

History modes "on" and "playback" will start playing the contents of the history memory on the screen and on the printer if it is running. As a warning that the displayed bottom contour is from the memory and not real time, "History" is flashing at the bottom of the screen.

The "history time" button used with the encoder will enable positioning within the 30 minute memory to observe the desired part of the time frame during playback. The History information is kept in a RAM memory with battery backup. The battery is normally expected to last the lifetime of the system unless the unit has been kept in store for many years with no external power applied and the battery enabled.

Simulator

The GDS101 contains a built in simulator to exercise the screen and printer and various interface signals. The simulator may be switched on and off on Screen 9. When the simulator is operating, "Demo" is flashing at the bottom of the screen.

Status Screen

The Status screen, Screen 9 shows a list of various system parameters useful for documenting system set-up and system operating status. The contents of this screen will be valuable information in situations where manufacturer support is required.

Oscilloscope Screen

The Oscilloscope screen, Screen10 is useful when monitoring transducer performance. The oscillogram shows the signal returned from the transceiver plotted against time and will enable service personnel to evaluate system performance and facilitate any troubleshooting.

Non-volatile Parameter Memory.

The system contains non-volatile memory to maintain installation and user parameters like Language and unit of measurement selection, Contrast and Backlight settings, etc. These parameters are kept in EEPROM memory and are automatically restored on power up. If the user parameters have never been set, default values are used.

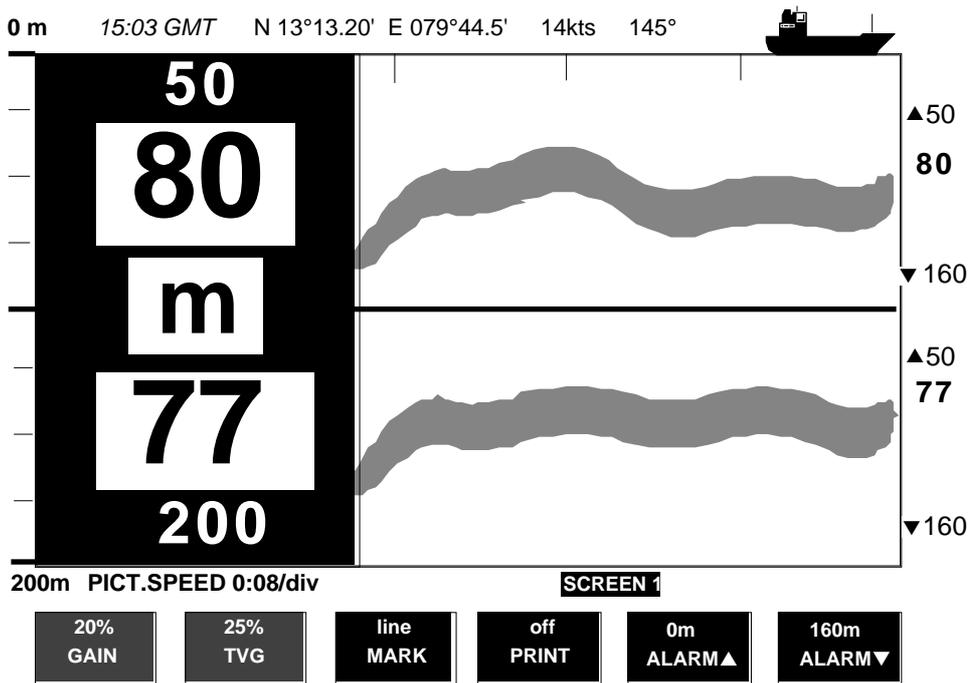
Options.

Repeaters/Slaves

Graphic display or digital depth slave repeaters may be connected to the system. Along with the graphic display repeaters there may also be installed remote keyboards.

Dual Frequency Screen.

A special option enables two different frequencies to be connected and displayed simultaneously. The main application will be two transducers placed at different locations of the vessel to facilitate harbour operations or manoeuvres under other shallow conditions. If installed, this option is accessible with the FREQUENCY button on Screen 2.



Remote Sounding Control.

This option lets the GDS101 being controlled remotely in synchronised, burst or single ping modes. If installed, this option is accessible on Screen 3.

Auto Range

This option will automatically adjust the depth range to maintain the bottom contour within the middle half of the screen height. If installed, this option is accessible on Screen 3. When the printer is started, Auto Range is automatically disabled, and the present depth range is selected as fixed.

Sound speed calibration

This option will enable adjustment of the sound speed value used for the depth calculations. The standard value is 1500 m/s, but the user may set values from 1400 to 1550 m/s to accommodate accurate propagation speed in known water conditions. If installed, this option is accessible on Screen 3.

3. User Maintenance

Transducer Maintenance.

The transducers are virtually maintenance free, but occasional cleaning may be necessary depending on sea water conditions.

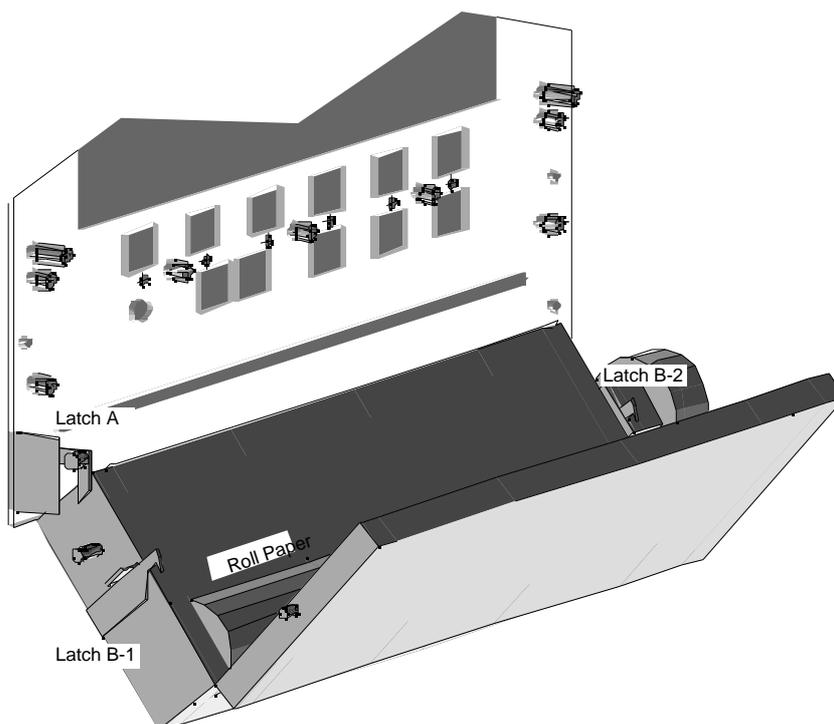
Operator Unit Maintenance.

Apart from the printer, the operator unit contains no user serviceable parts, and requires no maintenance apart from occasional cleaning of the front panel. Please use a soft cloth and no chemicals except cleaning alcohol.

Printer Paper Replacement.

Printer paper is replaced as follows:

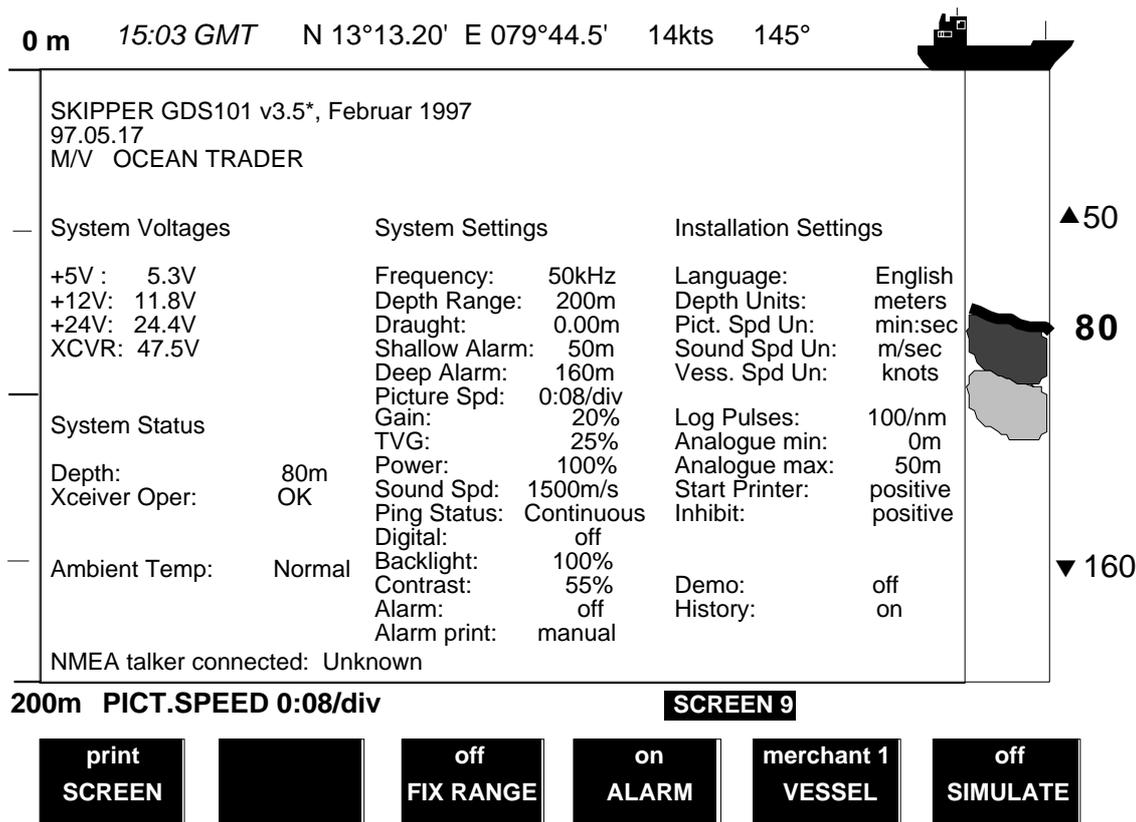
1. Open the main panel door fully. There must be at least 70 mm free space below the opened door.
2. Release latch A at the left side of the printer mechanism and swing the printer down.
3. Release latch B on the printer side and open the Print-head fixture to expose the paper roll.
4. Replace the paper roll, moving the plastic bearings from the old to the new core. Always use these bearings to reduce wear on the paper and pinch roller.
5. Lead the paper past the Print-head and carefully close the Printhead fixture by pressing with one hand at each side of the printer till both latches B-1 and B-2 close.
6. Lead the paper slip through the panel slot while lifting the printer till latch A closes.
7. Close the main panel door.



Trouble Shooting

Symptom	Cause	Remedy
Basic System Integrity		
No Picture on LCD Screen	No AC or DC power to the system System is in Standby Too low Screen Contrast Defective LCD module or Interface Voltage(s) out of Range	Check Switches and Fuses on the Terminal Board inside the GDS101 Cabinet. Press any Button on Panel Increase Contrast Setting Replace Module or Interface PCB Replace Terminal PCB
Picture is difficult to read	Too low or high Screen Contrast Backlight is too weak	Increase or decrease Contrast Setting Increase Backlight Setting
Display Backlight malfunctions, Display picture is visible	Defective Backlight tubes Defective Backlight power inverter	Replace Tube Assembly Replace Keyboard PCB
Rotary Encoder malfunctions	Defective Encoder or interface	Replace Keyboard PCB or Interface PCB
Panel Buttons malfunction	Defective Buttons or interface One button stuck	Replace Keyboard PCB or Interface PCB Check Key Switches or Replace Keyboard PCB

Typical Status Screen (9) Contents.



The Status Screen (9) contain information that will facilitate analysis and correction of several problems.

A printout of the Status and Oscilloscope Screens should be sent by fax with any report about functional Disturbances. This will greatly facilitate remote failure Analysis.

If it is at all possible to cycle through the screens and observe this information, several assumptions may be made regarding operation of the GDS101 System. Although some of the subsystems necessary for this basic system operation may still suffer from minor or intermittent operation disorders, the fact that it is possible to select and observe this screen, indicate correct operation of the following GDS101 Subsystems:

1. The Computer is operating.
2. The Screen Interface (VGA) Board is working.
3. The Keyboard interface Board with Backlight and LCD power supplies is working.
4. The Keyboard Interface Part of the I/O Board is working.
5. The Power Supplies on the terminal board are basically working.

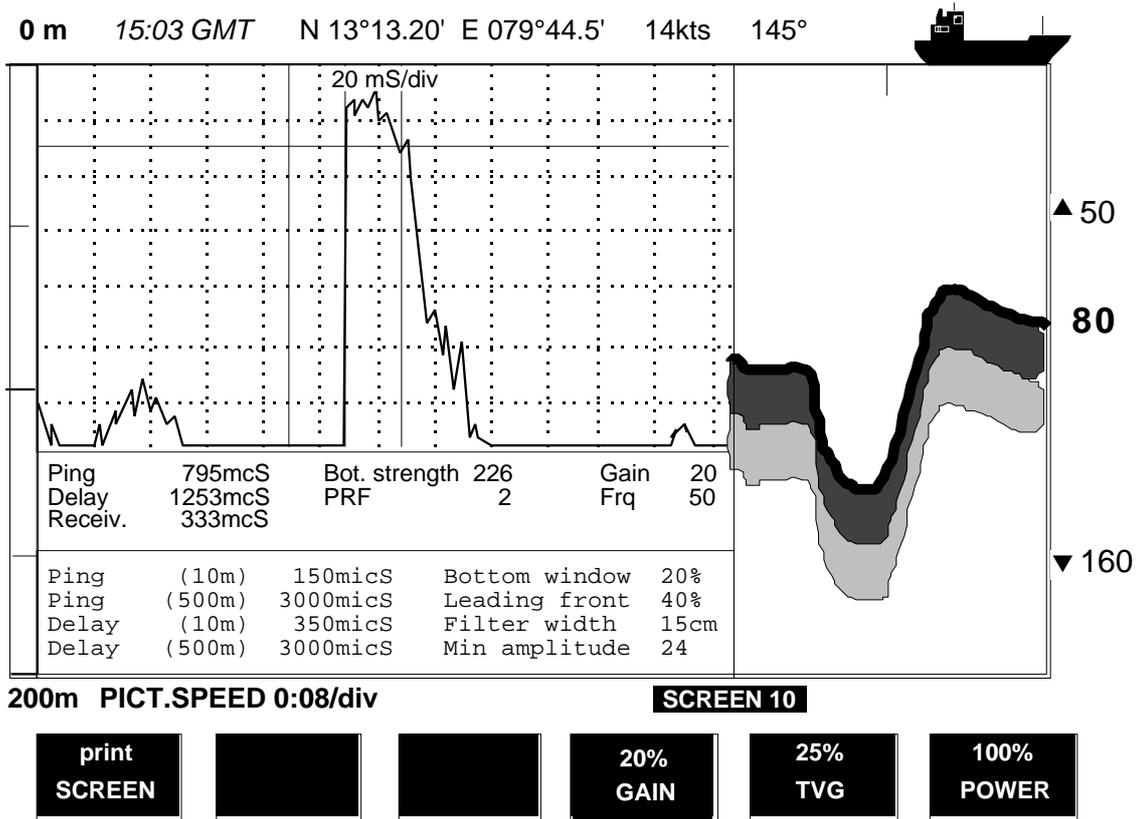
Further, if it is possible to press the "Print Screen" Softkey button and obtain a Hard copy of the Screen Contents, the following Subsystems also operate correctly:

6. The Printer Interface part of the I/O Board is working.
7. The printer interconnect Board is working.
8. The thermal Printer including Printhead and Paper Feed is operating.

Symptom	Cause	Remedy
Status Screen Diagnosis		
Main Voltages out of Range +5V: 4.7V - 5.3V +12V: 11.3V - 12.7V +24V: 22.5V - 25.5V	Defective Power Supply Power Supply Overload	Replace Terminal Board. +5V: Computer or I/O Board Problem. +12V: Transceiver Problem. +24V: Printer or Printer Interconnect Problem.
Transceiver (XCVR) Voltage low	Power Setting to low Defective Power Supply	Increase Power Setting Replace Terminal Board or I/O Board.

The other information on the Status screen is a collection of information which may be observed and manipulated with the various screen softkey selections. As a reference, it will often be more convenient to observe the various settings together on this screen than to cycle from screen to screen to check on the softkey texts.

Typical Oscilloscope Screen (10) Contents.



This Oscilloscope Screen (10) show a typical oscillogram of a bottom echo (the tall peak in the centre of the diagram) and a weaker fish echo to the left of it. The horizontal axis represent time for the sound to travel down and back from an object. The vessel is located at the left edge of the grid, and the right edge represent the deep range. The vertical axis represent the magnitude of the echo signal received.

Symptom	Cause	Remedy
Basic Functionality		
No Bottom Detection or Bottom Contour	Too low Gain Setting Too low TVG Setting Too low Power Setting Wrong Frequency Selection	Adjust Settings Select correct frequency
Bottom tracking is intermittent or erroneous	Marginal Gain, TVG or Power Settings Weather Conditions Transducer installation faulty	Adjust settings Try adjusting Gain, TVG or Power Settings. Check transducer wiring, Receiver LED on interface Board or Oscilloscope Screen.
Bottom tracking is masked by high noise levels	Too high Gain Setting Too high TVG setting To high Power Setting	Adjust settings

Symptom	Cause	Remedy
Printer Operation		
Printer does not run	No Paper Paper out Switch stuck	Load Roll Paper Open Printer and check Paper feed
Erroneous Paper movement	Printer feed Motor Driver faulty	Replace Printer interconnect PCB.
Printer runs but no paper comes out	Paper not fed properly	Open Printer and check Paper feed
Weak or no printing on paper	Wrong Type of thermal Paper Paper rolled Surface inside	Use original thermal sensitive Paper Use original thermal sensitive Paper or try to fit the Paper Roll inverted
Major part of Paper unprinted	Faulty Printer Interface	Replace Interface PCB
Black or white continuous lines along paper	Faulty thermal Print Head	Replace thermal Print Head
Printed paper fades with time	Normal characteristic of thermal Paper	Store Paper dark and cool

Symptom	Cause	Remedy
NMEA Interface etc.		
NMEA input signals are not listed in the NMEA Screen (8).	Wrong Polarity input Signals	Swap NMEA0183 Input wires
NMEA input signals are listed in the NMEA Screen (8), but not accepted by the GDS101	GDS101 Initialisation Irregular Message Mnemonic	Cycle GDS101 power after NMEA Connection is established. Check Remote (Talker) Setup.
NMEA output signals are not accepted by the remote system	Remote (Listener) Setup	Verify correct Remote (Listener) Setup.
Analogue output malfunctions.	Incorrect Range Setting.	Verify upper & lower Limits in Screen 6.
Pulse output malfunctions	Incorrect Pulse Frequency Setting.	Verify Pulse Setting in Screen 6.
External Control Inputs malfunction, Inhibit/External Printer Control	Incorrect Polarity or Function Settings	Verify Settings in Screen 6.

4. Installation

Standard System Supply.

A Basic GDS101 system consists of the following units. See **Fig. 4.1**:

Pos.	Description
1	Operator Unit
2	Transducer Junction Box(es)
3	Approved transducer steel tank(s)
4	Transducer(s) with attached cable(s)

Transducer Installation.

Location.

Single transducers are normally installed in the foreship. Larger vessels are often fitted with two transducers, one fore and one aft.

Optimal system operation is achieved by fitting the transducer as deep as possible on the hull. The transmitting surface of the transducer must be installed horizontal. On vessels with a deep keel, if the transducer must be fitted higher than the keel, it should be fitted towards the side, as far from the keel as possible to avoid false keel echoes.

Do not mount transducers close to the propeller or aft of other hull installations (outlets, vents or other protruding details).

It is of course necessary to select a part of the hull that is submerged under all load and speed conditions, and to avoid positions where air is trapped in heavy weather.

If a flat, horizontal section is not available for transducer fitting, the shipyard must construct a suitable bed.

Protect the active element of the transducer and do not paint the surface.

Installation Details.

Refer to SKIPPER's standard installation procedures in the appendix regarding tank installation, welding, Cable glands etc.

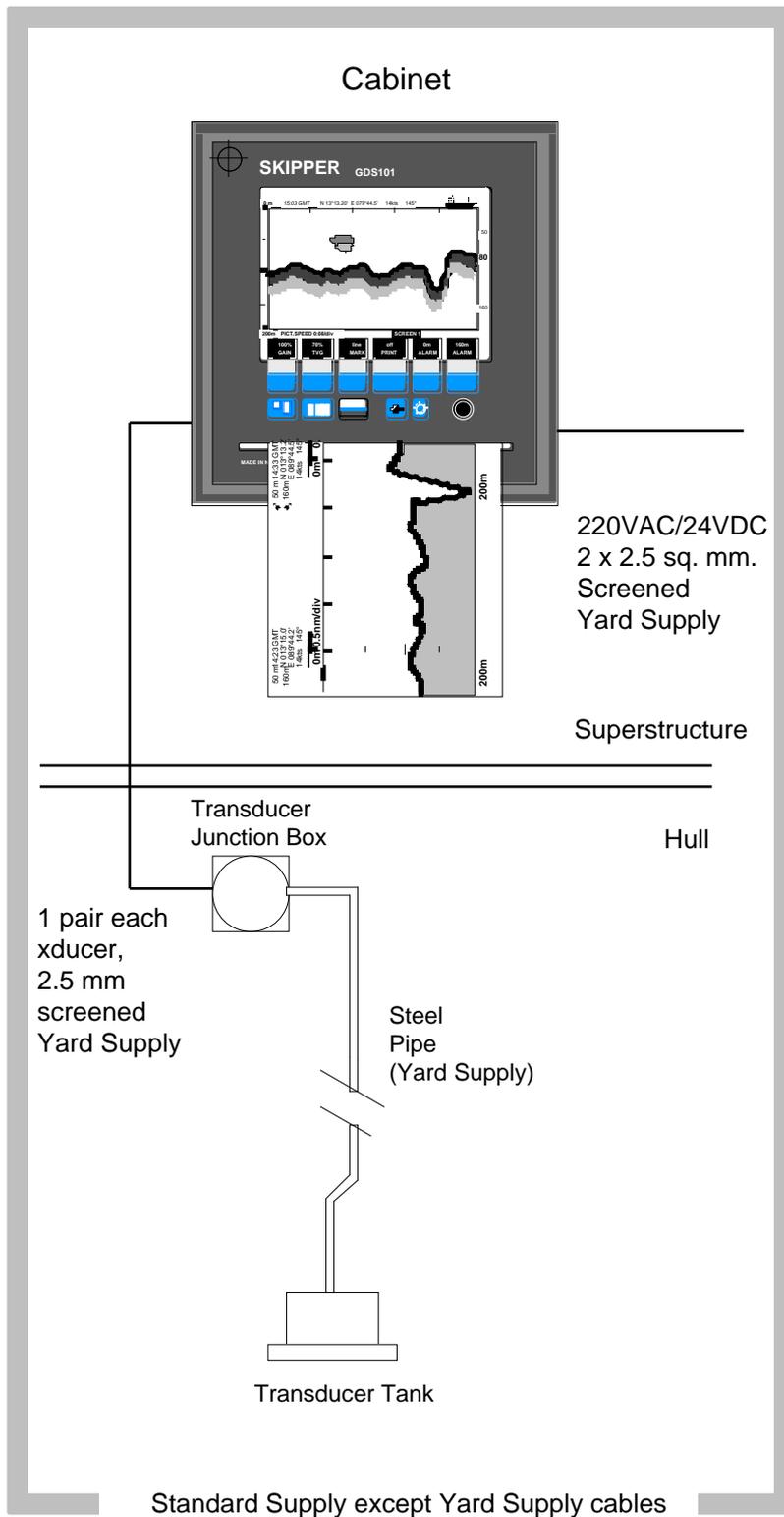


Fig. 4.1 Basic System Configuration.

Transducer Junction Box.

The standard cable fitted on the transducer is 25 m and may be shortened or extended. The junction box is used to interconnect the transducers fixed cable to a yard supply extension cable if the total required cable length is longer than the standard cable. It is recommended to run the standard cable in a steel protecting pipe.

Special requirements apply in areas with Ex conditions. The junction box must always be mounted outside such areas.

Interconnect the transducer pair and its screen in the junction box, but do not ground the screen here.

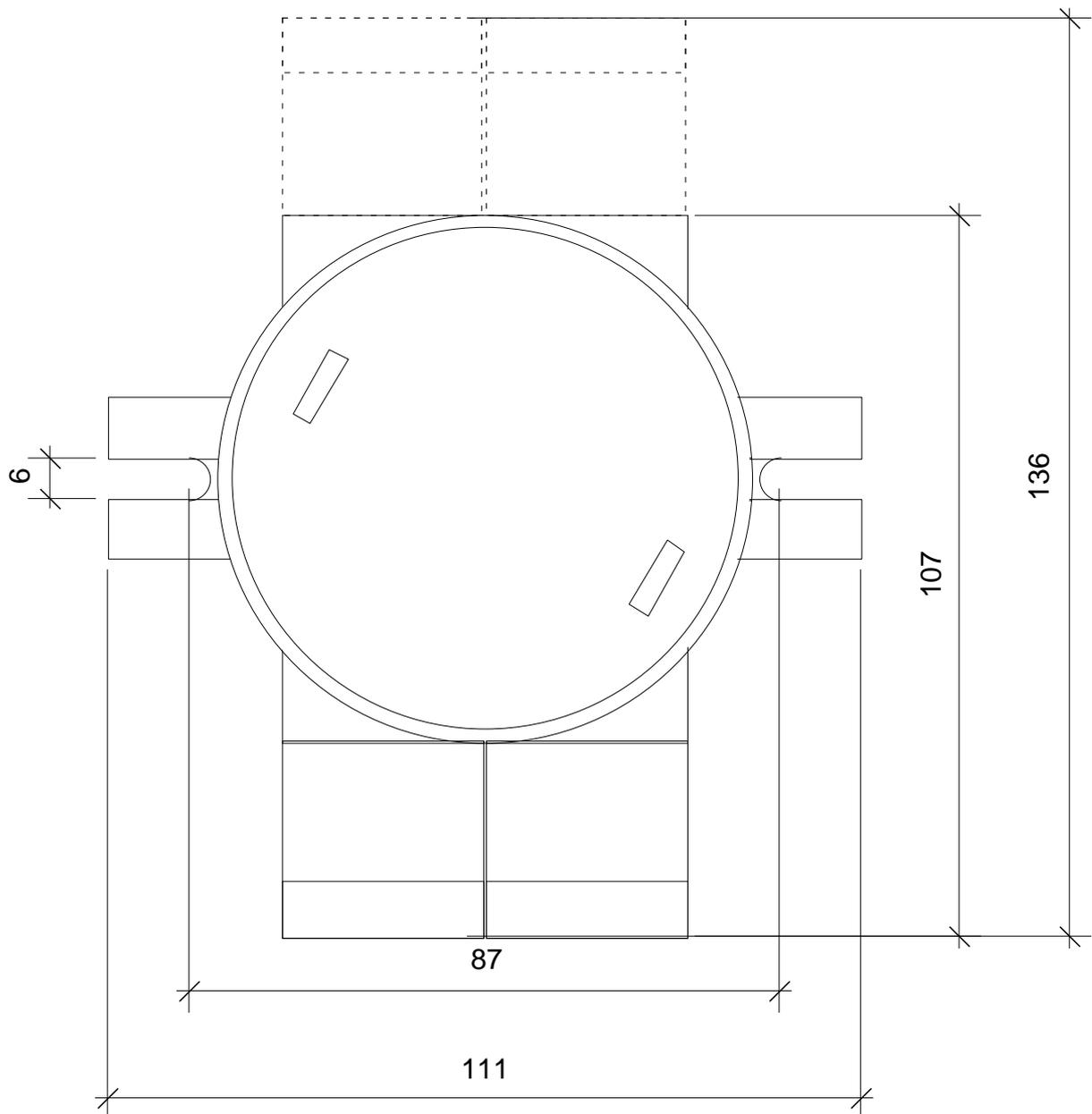


Fig. 4.2 Transducer Junction Box, Dimensions.

Operator Unit Installation.

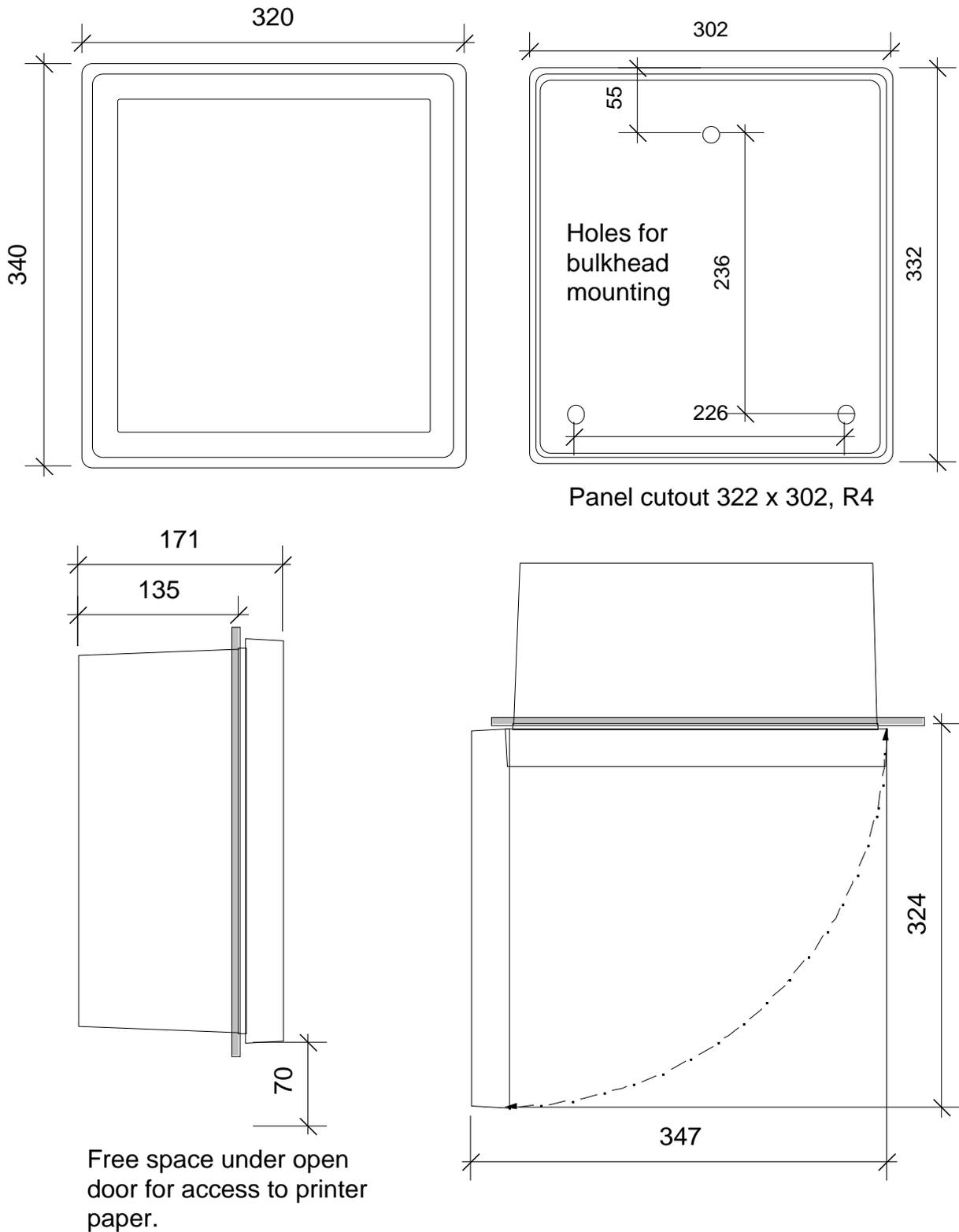


Fig 4.3 Operator Unit, Dimensions.

Select a position to provide free view of the panel as well as easy access during operation and service.

The operator unit may be mounted flush in a panel or directly onto a bulkhead. Fig. 4.3 shows the operator unit along with the main installation dimensions.

If the unit is to be flush mounted, the shown cut-out and recession depth dimensions must be observed.

Remember to leave room in front of the unit to open the door a full 90°.

Also observe that there must be at least 70 mm free space available below the opened door to facilitate replacement of the printer paper.

Do not perform installation work with system power applied!!

Cables are led through the appropriate cable glands as follows:

The cable from the transducer(s) should normally occupy the left gland. The right gland is used for power supply connection whereas the centre ones are used for any interface signals connected.

Power supply may be either 220V/110V AC or 24V DC. Power consumption is appx. 50 W at 24V, appx. 70W at 110/220V.

The transducer is always connected with 1 pair plus screen. See Fig 4.7.

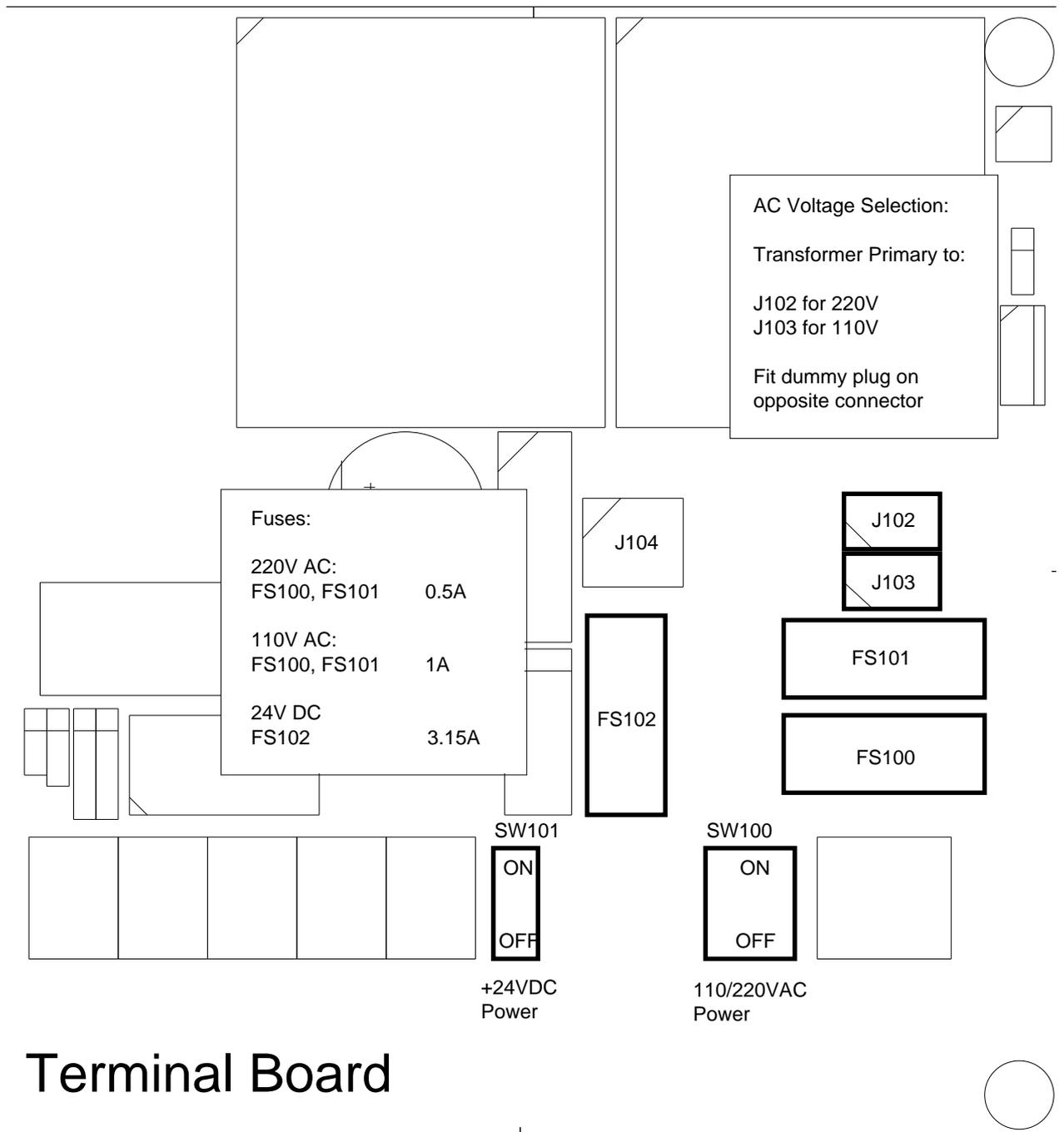
If the AC power system is 110V, GDS101 may be prepared for 110V AC by re-connecting the connectors J102, J103 as shown in Fig. 4.4

This diagram also shows position of fuses for 220/110 VAC and 24 V DC. These fuses are normal 5 x 20 mm glass fuses.

AC supply:	FS100, FS101	220V	0.5A
		110V	1A
DC supply:	FS102		3.15A

When the installation is complete, and power is connected to the Operator Unit, the appropriate power switch by the power terminals is switched on. For daily operation, these switches may stay on and the unit is switched off by pressing the "SYSTEM off" button on Screen 2. The unit is switched on by pressing any button.

Both 220/110 VAC and 24V DC power may be connected and switched on at the same time. If one of these supplies shuts down, changeover is automatic.



Terminal Board

Fig. 4.4 Voltage selection connectors and fuses, Terminal Board.

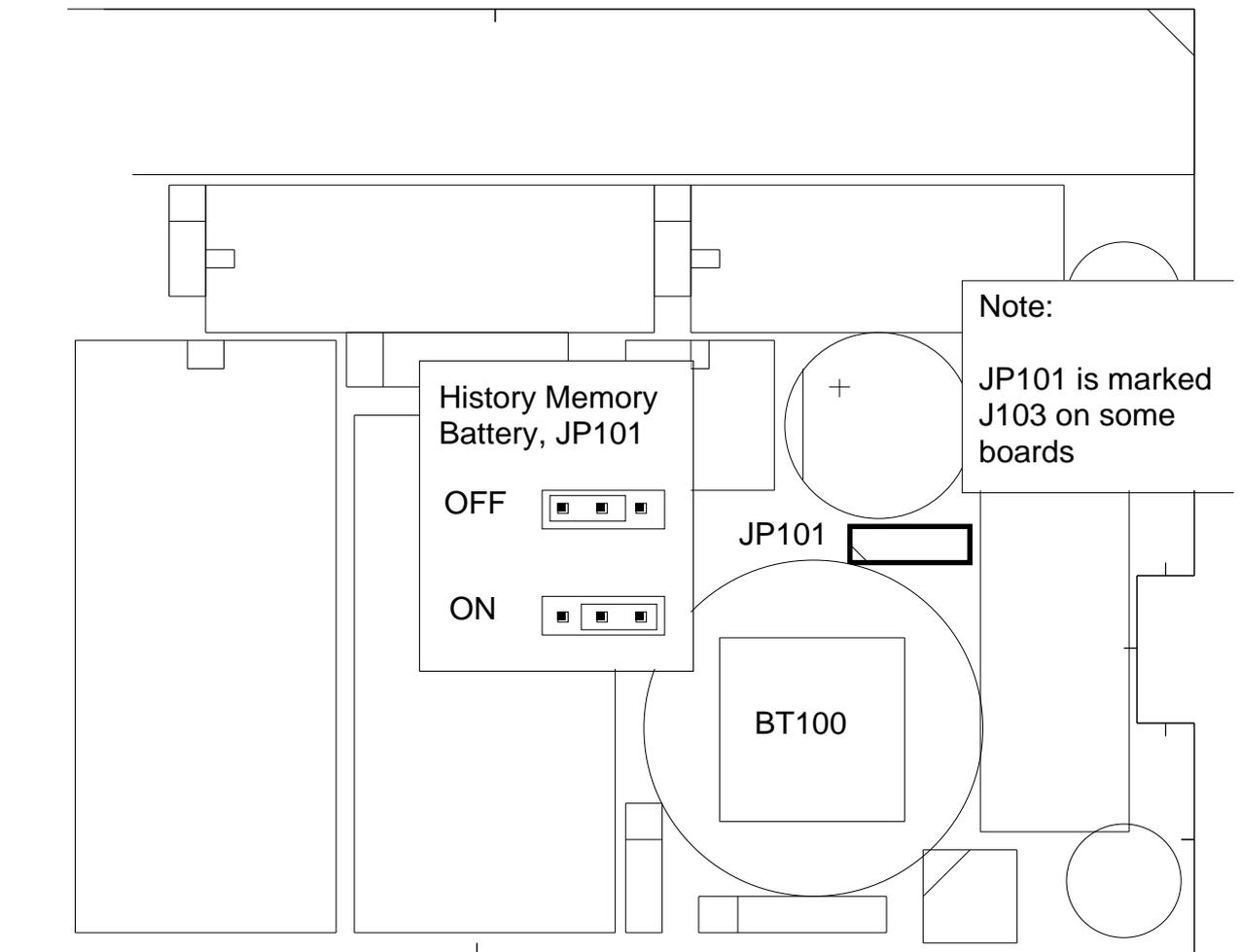


Fig. 4.5 History Memory Battery Jumper, I/O Board.

Back-up Battery Jumper

After installation is complete and system power is applied, it is necessary to connect the history memory battery to provide power to the History Memory during system power failure. Refer to Fig. 4.5 for the correct setting of the History Memory battery jumper "ON" position. This jumper should be set to the "OFF" position only during extended unit storage periods. The onboard battery is loaded only when no power is applied to the power terminals.

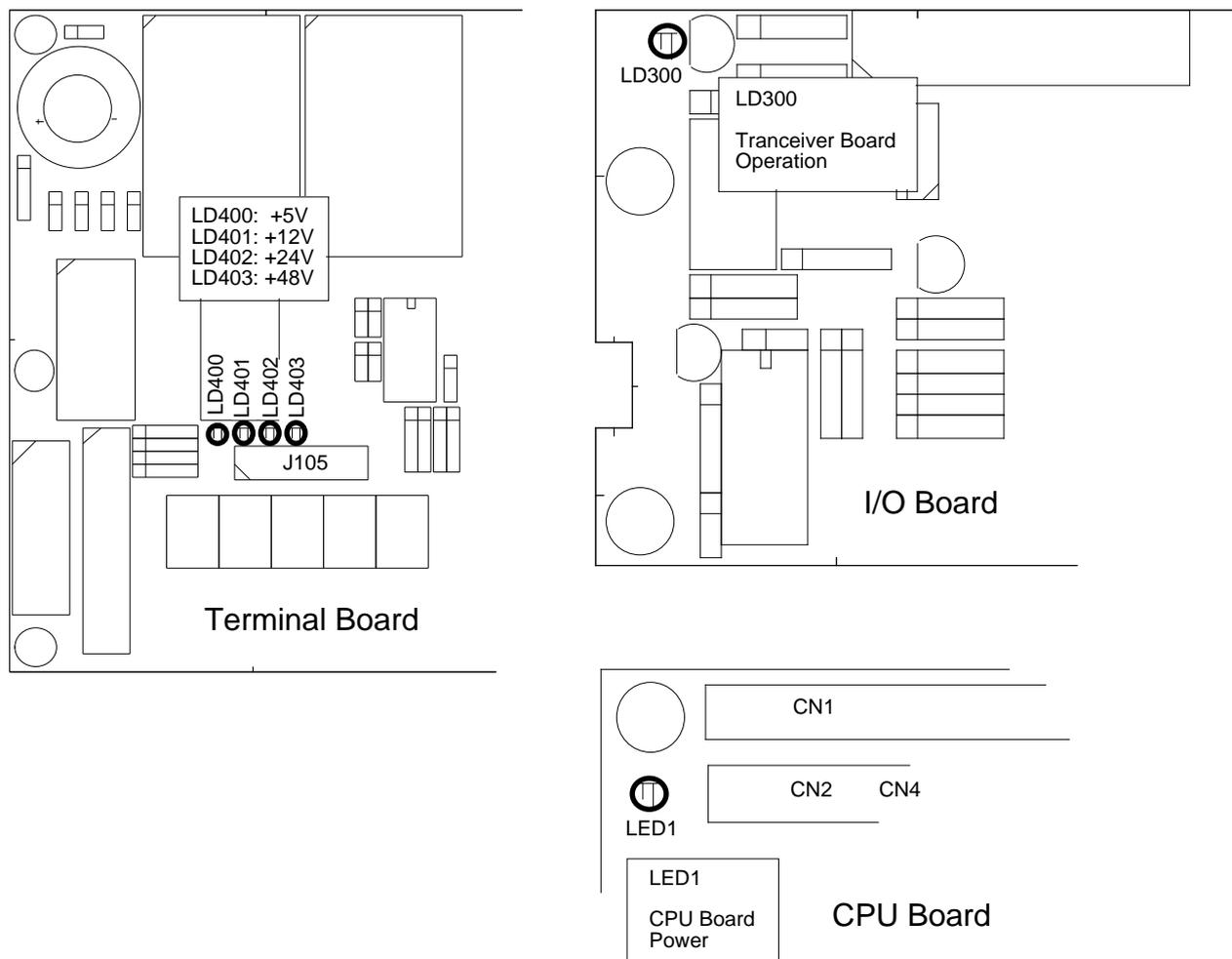


Fig. 4.6 Function LED's, Terminal, I/O and CPU Boards.

Power Indication and function LED's.

The following LED's are located on the Terminal Board:

LD400	+5V
LD401	+12V
LD402	+24V
LD403	+48V

The following function LED is located on the I/O Board:

LD300	Tranceiver board operation
-------	----------------------------

There is one function LED on the CPU board

LED1	CPU board power
------	-----------------

Fig. 4.6 indicates position of these LED's.

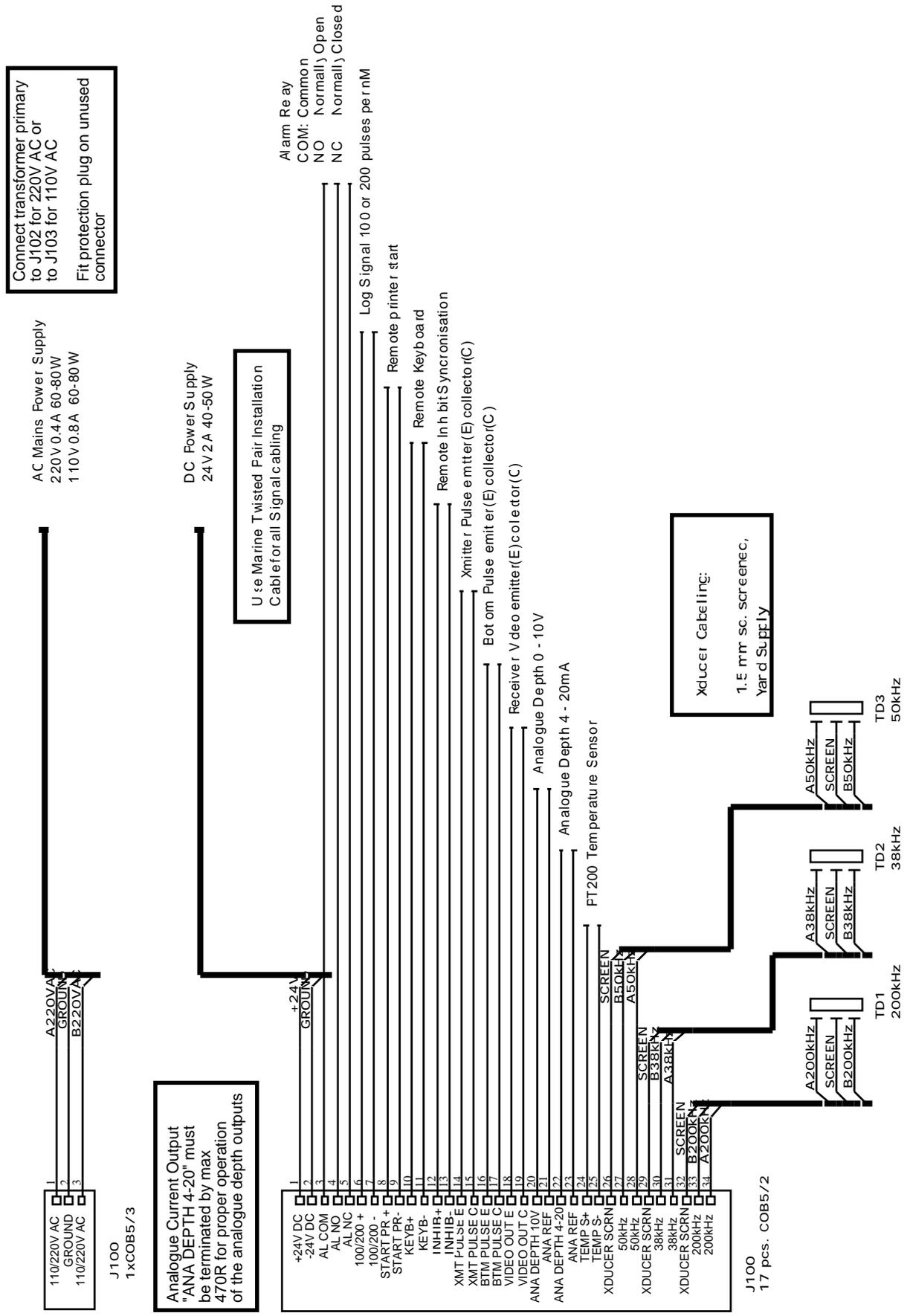


Fig. 4.7 Main Wiring Diagram.

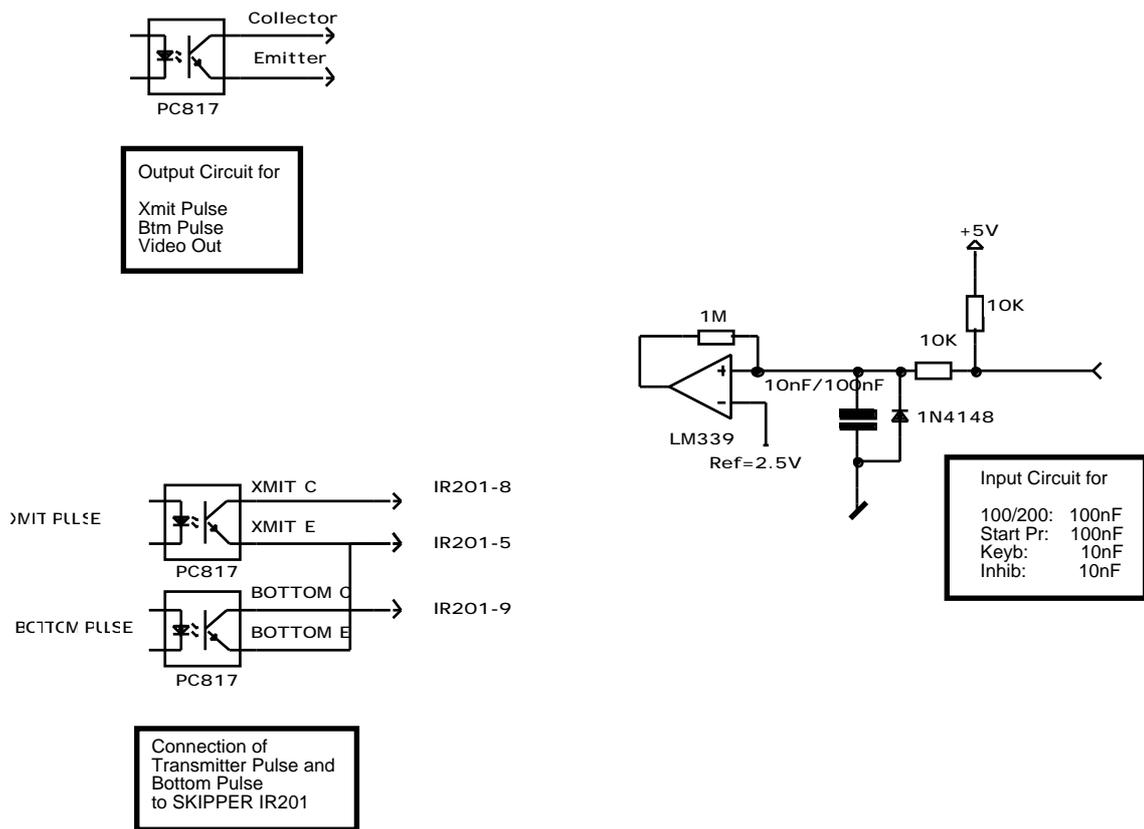


Fig. 4.8 Input/Output Circuitry.

Interfacing.

Alarm relay

An alarm relay is provided for interconnection to external alarm systems. This relay is normally energised, and is released by alarm conditions or power failure/power off. See Fig. 4.7.

The terminals have the following significance:

ALCOM	Common Terminal.
ALNC	Normally closed Contact (Normal = "No alarm" condition)
ALNO	Normally open Contact

Log Pulse input

See Fig. 4.7 and 4.8.

Pulse input terminals are as follows:

100/200 +	Log Pulse Input +.
100/200 -	Log Pulse Input -.

Refer to Screen 6 for selection of the log pulse rate.

External Printer Control input

See Fig. 4.7 and 4.8.

Printer control input terminals are as follows:

STPRINT +	Printer Control Input +.
STPRINT -	Printer Control Input -.

Refer to Screen 6 for selection of the printer control signal polarity and function option. Function options are described in chapter 3.

Transmitter and Bottom Pulse outputs

See Fig. 4.7 and 4.8.

Pulse output terminals are as follows:

XMIT C	Collector of Output Opto Coupler, Transmitter Pulse.
XMIT E	Emitter of Output Opto Coupler, Transmitter Pulse..
BOTTOM C	Collector of Output Opto coupler, Bottom Pulse.
BOTTOM E	Emitter of Output Opto coupler, Bottom Pulse.

Analogue interfaces

GDS101 is equipped with analogue outputs to supply analogue repeaters or other equipment with analogue inputs. The signals are galvanically connected to the GDS101. Standard range is 0 - 10V or 4 - 20mA corresponding to Shallow Max, Deep Max Settings. These settings may be accessed on Screen 5.

See Fig. 4.7.

Analogue outputs from the GDS101 have the following significance:

ANA 10V	Positive analogue voltage output
ANA REF	Negative analogue reference
ANA 20MA	Positive analogue current output
ANA REF	Negative analogue reference

NMEA interface

The NMEA output provides NMEA0183 format depth information for other equipment with NMEA0183 inputs. Baud rate is 4800 or 9600, 8 bit, No parity. Several messages may be selected on Screen 7 and the enabled messages are transmitted every second.

The NMEA inputs accept position, speed, heading and UTC time messages from various navigators, compasses or speed logs.

The two inputs provided may be connected to different talkers, and both data streams will be received.

There is one output that will drive minimum of 10 standard NMEA0183 inputs

The NMEA0183 output and inputs are available on the J303 connector according to the diagram in fig. 4.9.

See Section 5, **Start-up and system adaption**, for a complete list of transmitted and received messages.

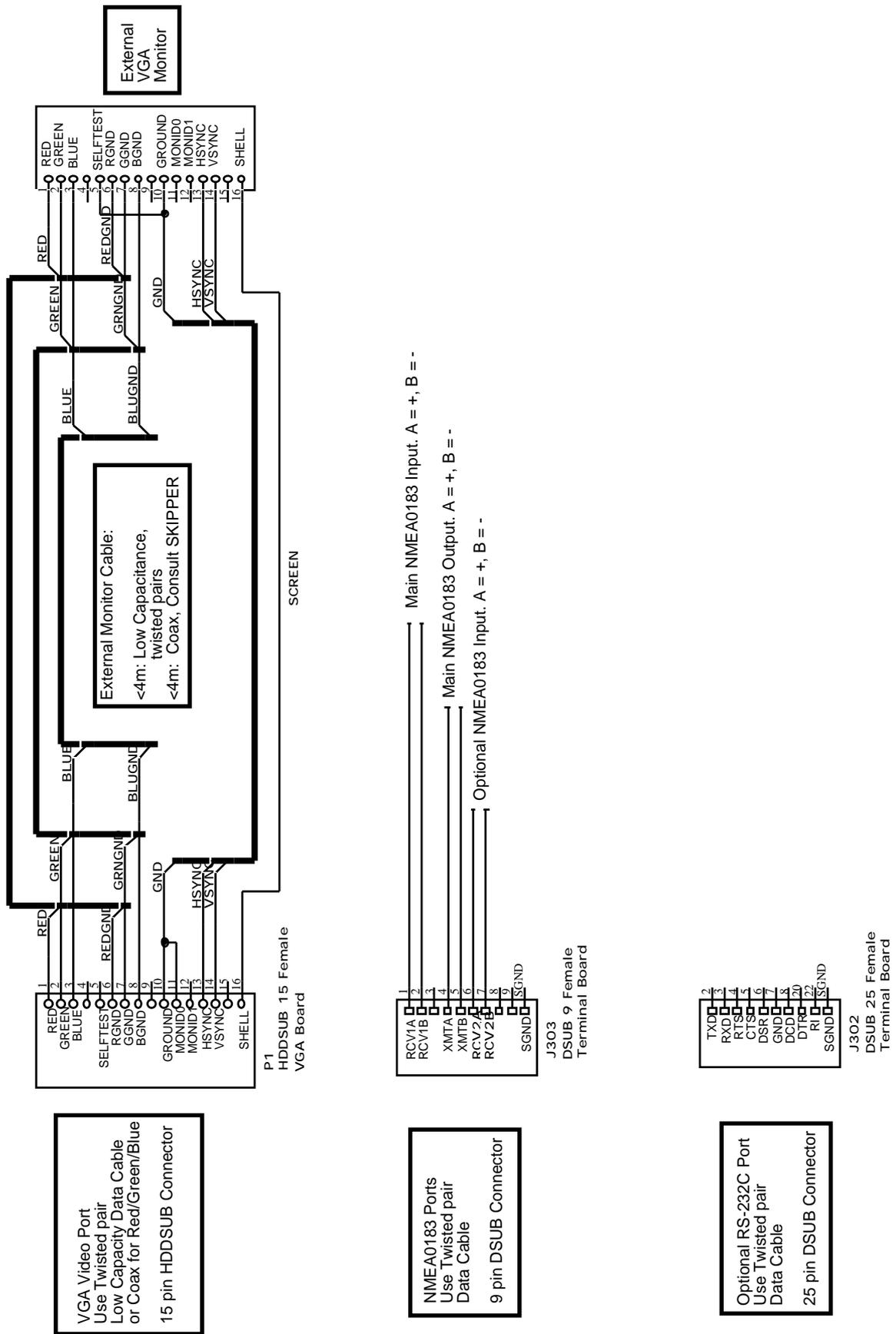


Fig. 4.9 Data Communication Interfaces.

Options.

Repeaters/Slaves

Graphic CRT(VGA) or LCD displays or digital depth slave repeaters may be connected to the system. Along with the graphic display repeaters there may also be installed remote keyboards. The graphic repeaters require the installation of line driver units dependant on the distance between the main system and the repeater.

See Fig. 4.7 and 4.9.

Remote Keyboard

The unit may optionally be operated from a remote keyboard.

KEYB-	Keyboard reference.
KEYB+	Keyboard signal.

See fig. 4.7 and 4.8

Dual Frequency Screen.

A special option enables two different transducers to be connected and displayed simultaneously. The main application will be two transducers placed at different locations of the vessel to facilitate manoeuvres under shallow conditions.

Remote Sounding Control.

This option lets the GDS101 being controlled remotely in synchronised, burst or single ping modes. If installed, these options are accessible on Screen 3.

See Fig. 4.7 and 4.8.

Sounder remote control terminals are as follows:

INHIB +	Control Signal Input +.
INHIB -	Control Signal Input -.

Refer to Screen 6 for selection of the control signal polarity.

5. Start-up and system adaption

System Adaption

Analogue Output And Log Pulse Input Range Selection.

From Screen 6 it is possible to set number of pulses per nautical mile (100 or 200) for the log pulse input.

Shallow and deep range limits for the analogue output may also be set, e.g.

50 m corresponding to 10V or 20 mA and

0 m corresponding to 0V or 4 mA.

Language and Units of Measure

From Screen 5 it is possible to select different languages and units of measure for the screen and printer character strings.

The available languages are: English, French, Spanish, Russian, German and Norwegian.

Units of measure may be selected for:

Depth:	meters, feet, fathoms, braccias.
Picture Speed:	min:sec, nm/div, km/div, miles/div.
Vessel Speed:	knots, km/h, miles/h.
Sound Speed:	m/s, feet/s.

External Printer Control

The printer operation may be controlled from an external system, e.g. manoeuvre recorder. The following function options are available on Screen 6:

STPRINT	positive/negative	Select Polarity of active Control Signal.
STPRINT	continuos	The printer is only controlled locally and is not affected by the external signal.
	edge	The printer is started by an active signal edge and will run until it is stopped locally.
	level	The printer is controlled by the signal level. An active level keeps the printer running, a passive level stops the printer.

NMEA Setup

Screen 7 is used for verification of received NMEA messages and control of transmitted NMEA depth messages. The baud-rate may be set to 4800 or 9600, 4800 being the more common. When a NMEA talker is connected to one of the GDS101 inputs, all received messages will be displayed on the screen.

If no messages are displayed, check the signal polarity and the baud-rate.

The following messages are accepted for input to GDS101 and interpreted by the program. The talker identifier is ignored:

Time

Universal Time	ZZU,xxxxxx
Universal Time & Local	ZLZ,xxxxxx,xxxxxx,-xx
Day, Month, Year	ZDA,xxxxxx,xx,xx,xxxx,-xx

Position

Geographical Lat/Lon	GLL,xxxx.xx,N,xxxx.xx,W
Geographical Fix, present	GXP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc,x
Omega Fix, present	GOP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
Loran C Fix, present	GLP,xxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
GPS Position	GGA,xxxxxx,xxxx.xxx,N,xxxx.xxx,W,x

Heading

Heading, true, present	HDT,xxx.,T
Heading, magnetic, present	HDM,xxx.,M
Heading, compass	HCC,xxx.

Speed

Dual Doppler Vector	VBW,uxx.xx,uxx.xx,a,uxx.xx,uxx.xx,a
---------------------	-------------------------------------

Composite

Loran C specific	RMA,a,xxxx.xx,N,xxxx.xx,W,,xx.x,xxx.,*xx
GPS, Transit specific	RMC,xxxxxx,a,xxxx.xx,N,xxxx.xx,W,xx.x,xxx.,xxxxxx,*xx
Vessel Identification	IMA,aaaaaaaaaaaa,aaaxxxx,xxxx.xx,N,xxxx.xx,W,xxx.x,T,xxx.,M,xx.x,N
Track & Ground speed	VTG,xxx.,T,xxx.,M,xx.x,N,xx.x,K
Heading & Water speed	VHW,xxx.,T,xxx.,M,xx.x,N,xx.x,K

The following messages may be transmitted (Selected from Screen 7 and dependant on the DRAUGHT setting). The messages are enabled individually. Transmitted talker identifier is SD, Sounder **D**epth:

Depth & Draught	SDDPT,xxxx.x,xxxx.x
Depth below surface	SDDBS,xxxx.x,f,xxxx.x,M,xxx.x,F
Depth below transducer	SDDBT,xxxx.x,f,xxxx.x,M,xxx.x,F)
Depth below keel	SDDBK,xxxx.x,f,xxxx.x,M,xxx.x,F)

Options

Calibration, Sound Speed.

The only calibration activity necessary is when the Sound Speed option is installed. In this case, set the required sound Speed value in Screen 3.

External Ping Control.

When this option is installed, transmitter operation may be controlled by the external INHIBIT signal. The active polarity of this signal may be set on Screen 6. The following function options are available on Screen 3:

PING	continuos	Transmitter operation is continuos and not affected by the external signal.
	edge	The transmitter is activated <u>once</u> by an active signal edge.
	level	The transmitter is controlled by the external signal level. An active level keeps the transmitter running, a passive level stops the transmitter.
	single	The transmitter is activated ping by ping by pressing the PICTURE SPEED button on the Operator panel. The external INHIBIT signal is disabled.

6. Specifications

Dimensions

Transducer, 38 kHz	H * W * L Mounting Cable length	101 * 206 * 255 mm Tank 40m
Transducer, 50 kHz	Diameter Mounting Cable length	90 mm Tank 25m
Transducer, 200 kHz	Diameter Mounting Cable length	140 mm Tank 25m
Transducer Junction Box	Size incl. glands Depth	132 * 111 mm 55 mm
Operator unit cabinet	Height, front Width Depth Weight	340 mm 320 mm 170 mm appx.10 kg
Operator Unit Cabinet, Cut-out for flush Mounting	H x W Corner Radius	322 x 302 mm 4 mm
Operator Unit Cabinet, Space for Paper Replacement	Below opened Door	70 mm

Functional Properties

Display:	150 x 200 mm graphic Dot-Matrix super twist LCD Screen with adjustable Contrast and Backlight. 640 x 480 pixels.
Printer:	8" thermal Printer with automatic or manual Start when required. All Information is printed.
Recording Paper Type:	8" (216mm) Width x 15m Length. High resolution thermal Paper type: TP216.
Depth Alarms	Deep and shallow Limits.
Calendar/Clock	Year-Month-Day / Hours-Minutes-Seconds (24 hour system).
Interface Outputs	Trigger- and Bottom-Pulses. Analogue 4-20 mA and 0 - 10 V for Depth. Detected Video. NMEA 0183 for Depth. Alarm Relay. Output for VGA Repeater. RS-232 C.
Interface Inputs	100/200 Pulses for Speed. NMEA0183 for Speed, Position, Heading and Time.

	Temp. Sensor Input. Remote Printer Start.
Languages	English, French, Spanish, Russian, German and Norwegian.
Options	SKIPPER IR201 digital remote depth Indicator. LCD Repeater. Remote Keyboard for use with Repeater. Dual Frequency Screen. Remote Sounding Control. Auto Range Sound speed calibration

Performance

Depth Range:		10 - 1600 m
Graphic resolution:		0.5% of Range
Digital resolution:		<10 m: 0.1 m 10 m: 1 m
Transducer, 38 kHz	Beam Angle	18° * 9°
	Max. Power	1kW
	Effective Range	1600m
Transducer, 50 kHz	Beam Angle	33° conical
	Max. Power	1kW
	Effective Range	1000m
Transducer, 200 kHz	Beam Angle	6° conical
	Max. Power	1kW
	Effective Range	500m

Environmental

Transducer and Junction Box

Operating temperature	0 - 50°C
Storage temperature:	-20 - 70°C
Protection, Transducer:	6 bar
Protection, parts inside hull:	IP66

Operator Unit Cabinet

Supply voltage:	220V or 110V AC, 24V DC (20-32V)
Power consumption:	50W at 24V, 70W at 220V
Alarm relay:	Change-over contact, max. 24V 300 mA
RS232 port:	Standard 25 pin D-Sub Connector.
NMEA port:	9 pin D-Sub. 2 Inputs, 1 Output.
Operating temperature:	0 - 40 °C
Storage temperature:	-20 - +70 °C
Humidity:	10 - 90% relative, no condensation.

7. Service

All service requests should be made to the local SKIPPER representative.

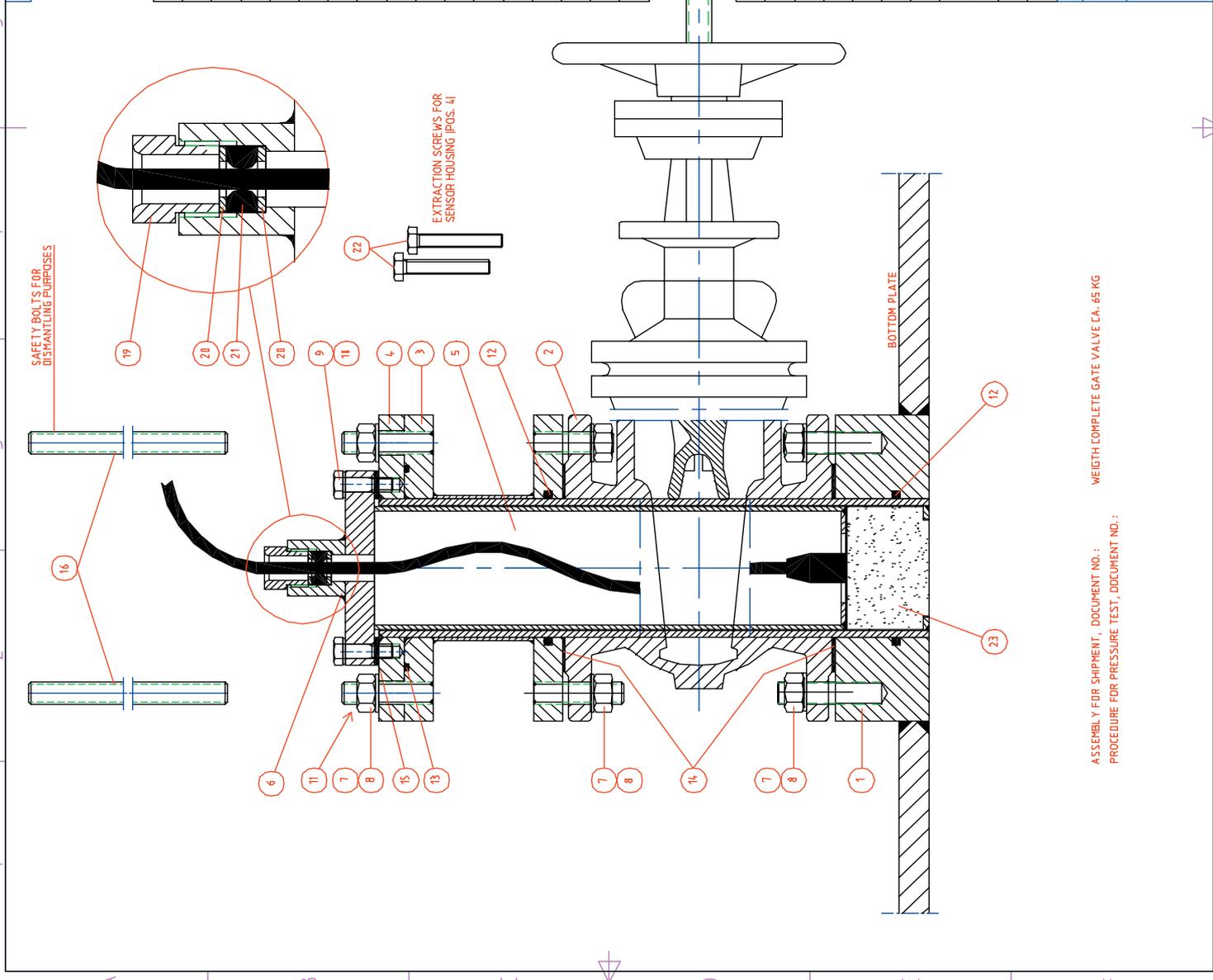
Adjustments and repairs should only be performed by qualified service engineers, and unqualified repair attempts will void the warranty.

8. Appendix

Miscellaneous Installation Drawings

Rev/No	Revision note	Date	Signature	Checked

ITEM	QTY.	DESCRIPTION	MATERIAL
23	1	Transducer Element	
22	2	Screw M10 x 60mm. DIN 933	St. steel
21	1	Gasket for CableGland Dwg.SB3023.B	Neoprene
20	2	Flat Washer Dwg. SB3023.B	A4 St. steel
19	1	Nut for Cable Gland Dwg. SB3023.B	Brass
18	4	Flat Washer M16 DIN125	A4 St. steel(Econosto only)
17	4	Locking Nut M16 DIN985	A4 St. steel(Econosto only)
16	2	Bolt M16 x 300	Galvanized steel
15	1	Gasket 3mm ø140/100mm Dwg.SB4014	Nitril
14	2	Gasket 1,5mm ø115/162mm Dwg.SB4014	Kingersil, DIN100
13	1	O-ring 139,29 x 3,53 DRAR00254	Nitril
12	2	O-ring 97,79 x 5,33 DRAR00344	Nitril
11	2	Screw M16 x 40 DIN933	A4 St. steel
10	4	Spring Washer M10 DIN127B	A4 St. steel
9	4	Screw M10 x 35 DIN933	A4 St. steel
8	24	Spring Washer M16 DIN127B	A4 St. steel
7	22	Nut M16 DIN934	A4 St. steel
6	1	Top Flange Dwg. SB3023	
5	1	Pressure Tube Dwg. SB3023.A	
4	1	Sensor Housing Dwg. SB3022	
3	1	Intermediate element Dwg. SB3021	
2	1	Gate Valve element	St. steel (NAF) Bronze (Econosto)
1	1	Bottom Flange Dwg. SB3024	

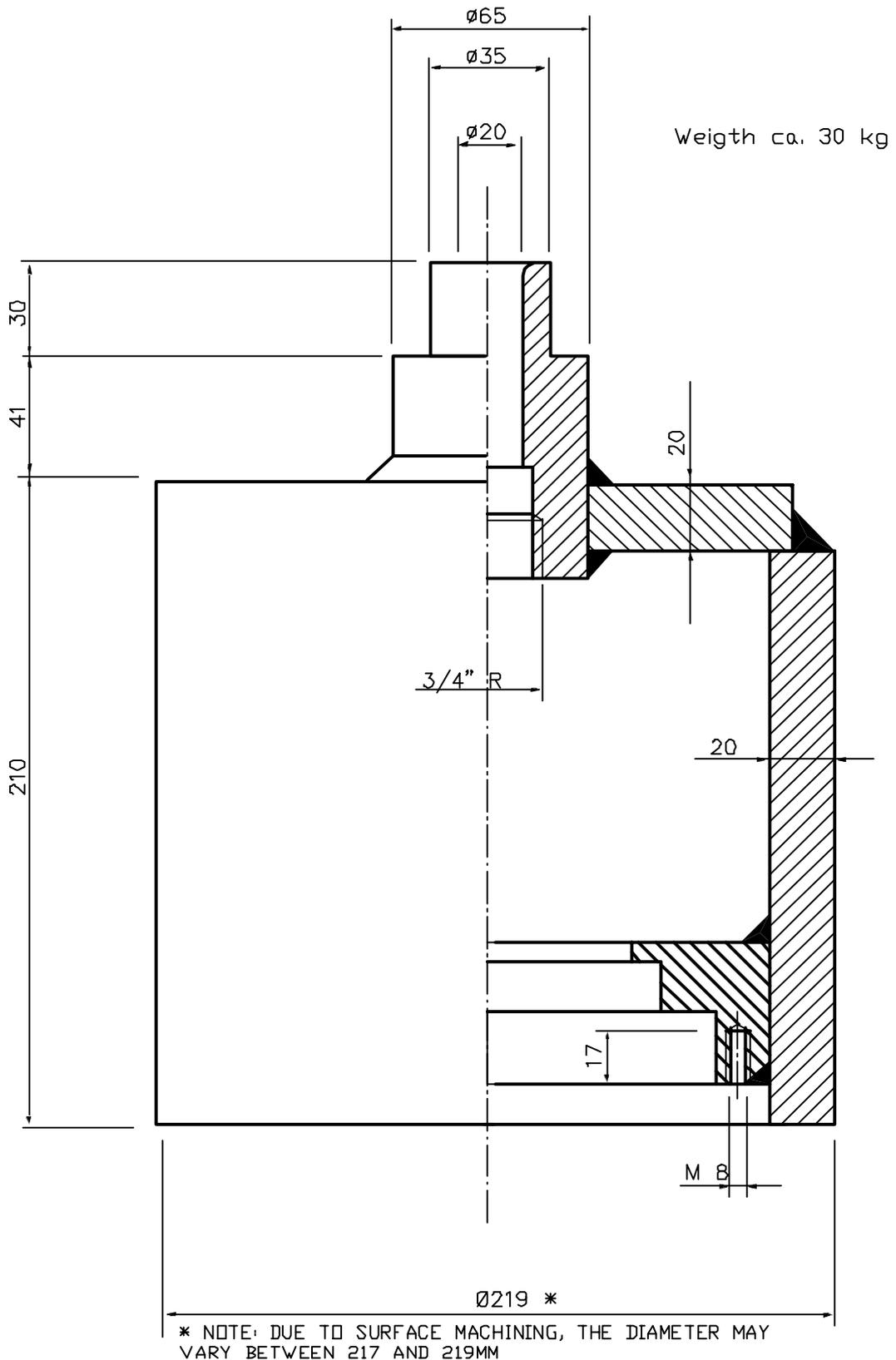


ASSEMBLY FOR SHIPMENT, DOCUMENT NO. :
 PROCEDURE FOR PRESSURE TEST, DOCUMENT NO. :
 WEIGHT COMPLETE GATE VALVE CA. 65 KG

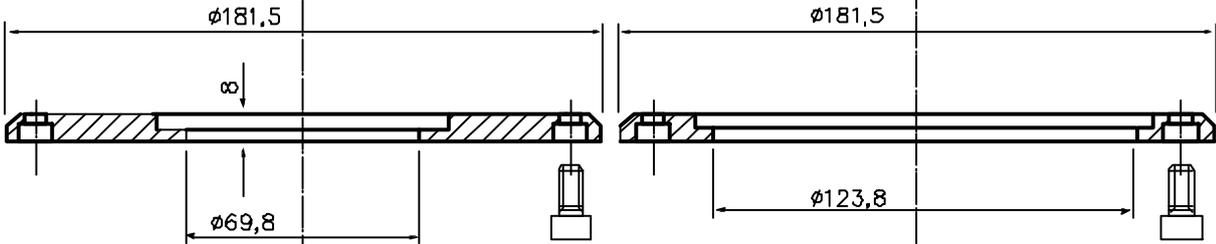
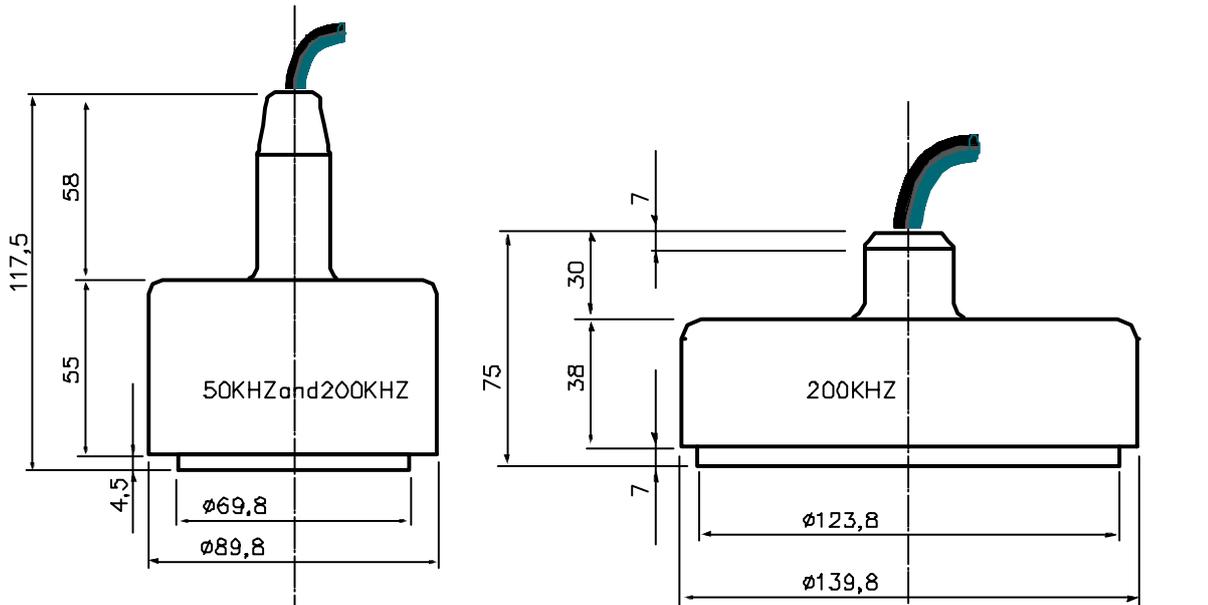
SKIPPER Electronics A/S

Itemref	Quantity	Title/Name, designation, material, dimension etc	Article No./Reference
Designed by TKN	Checked by VF	Approved by - date SG-23.08.01	File name Gate Valve Ecbp 04.01.99
GATE VALVE ARRANGEMENT For 50KHZ AND 200KHZ TRANSDUCERS			Date 04.01.99
SB 3020			Scale 1/1
Edition 0			Sheet 1/1

RevNo	Revision note	Date	Signature	Checked
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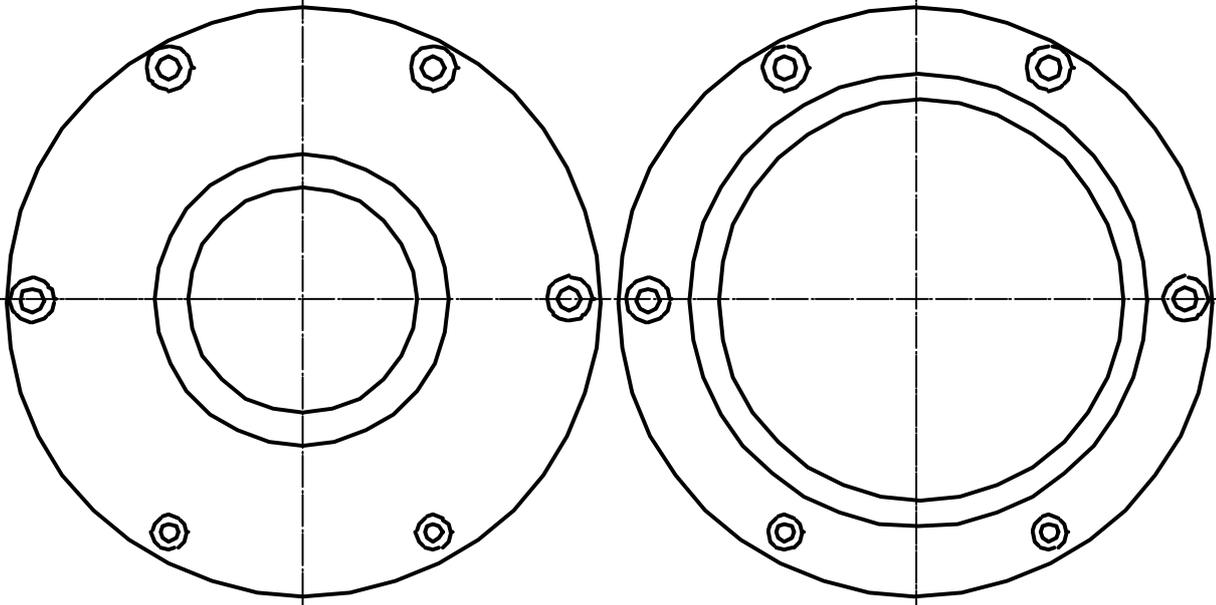


Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date	File name TB2002	Date 00/10/00	Scale 1:1	
Skipper Electronics AS			Transducer Tank			
			TB 2002	Edition 0	Sheet 1/1	



M8X16 ALLEN SCREW X 6

M8X16 ALLEN SCREW X 6



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date	File name TB2001	Date	Scale 1:1	
Skipper Electronics AS			Transducer and Mounting ring			
			TB 2001	Edition I	Sheet 1/1	

PROVIDE APPROX. 3/4 M OF CABLE BETWEEN CABLE GLAND AND THE TRANSDUCER ELEMENT

SØRG FOR AT KABELLENGDEN MELLOM KABELGJENNOMFØRING OG SVINGERELEMENT ER CA. 3/4 M.

TUBE
REF. TA 3004

RØR
REF. TA 3004

WASHER, STAINLESS

RUBBER GASKET

WASHER, STAINLESS

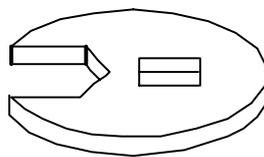
PACKING NIPPLE

SKIVE, RUSTFRI

GUMMIPAKNING

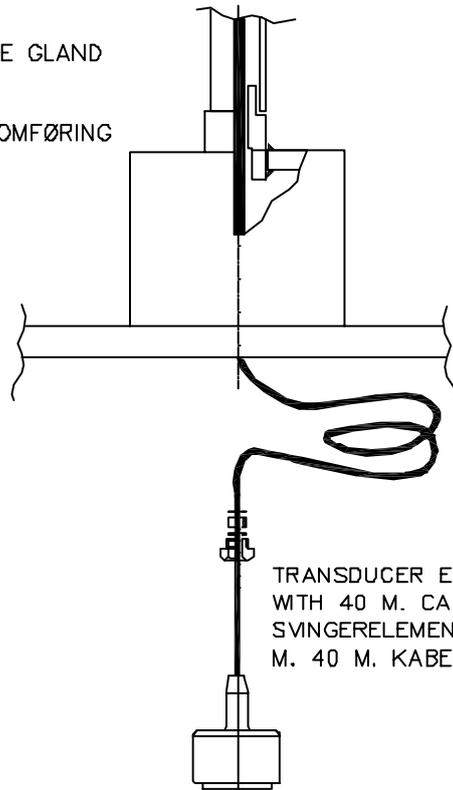
SKIVE, RUSTFRI

PAKKNIPPEL



SPECIAL WRENCH/TOOL FOR TIGHTENING OF PACKING NIPPLE

SPECIALVERKTØY FOR STRAMMING AV PAKKNIPPEL

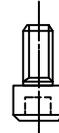


TRANSDUCER ELEMENT WITH 40 M. CABLE
SVINGERELEMENT M. 40 M. KABEL

MOUNTING RING
MONTASJERING

ALLEN SCREW M8X16
APPLY LEAD OR SIM. ON THREADS

SYL.HODE SKRUE M8X16
PÅFØR BLYHVITT ELLIGN. PÅ GJENGER



ALLEN KEY, 6MM
NØKKELE, 6MM

Itemref	Quantity	Title/Name, designation, material, dimension etc	Article No./Reference		
Designed by AM	Checked by VF	Approved by - date	File name TB3003	Date	Scale 1:1
Skipper Electronics AS			Mounting of Transducer		
			TB 3003	Edition I	Sheet 1/1

WATERTIGHT JUNCTION BOX MUST BE SITED FOR EASY ACCESS IN AN EXPLOSION-SAFE PLACE, OVER MAX. WATER LINE.

VANNETT KOPLINGSBOKS Plasseres på ikke eksplosjonsfarlig, lett tilgjengelig sted, over max. vannlinje.

STEEL PIPE, MIN. 35MM DIAM. INSIDE.
WALL THICKNESS:

- GALVANIZED PIPE: MINIMUM 6 MM
- BLACK PIPE: MINIMUM 10 MM

QUALITY OF MATERIAL:

- STATED IN VERITAS CAP. X. PARA. 7A, TYPE III
- THE PIPE TO BE WELDED BEFORE PULLING THE CABLE.
- EXPANDING POSSIBILITIES MUST BE ARRANGED.

MAXIMUM DISTANCE BETWEEN PIPE CLAMPS, 25 X PIPE DIAM.

STÅLRØR, INNV. DIAM. MIN. 35 MM

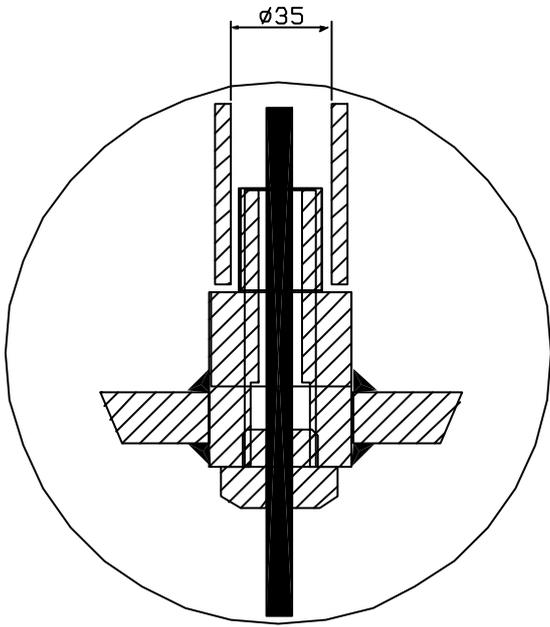
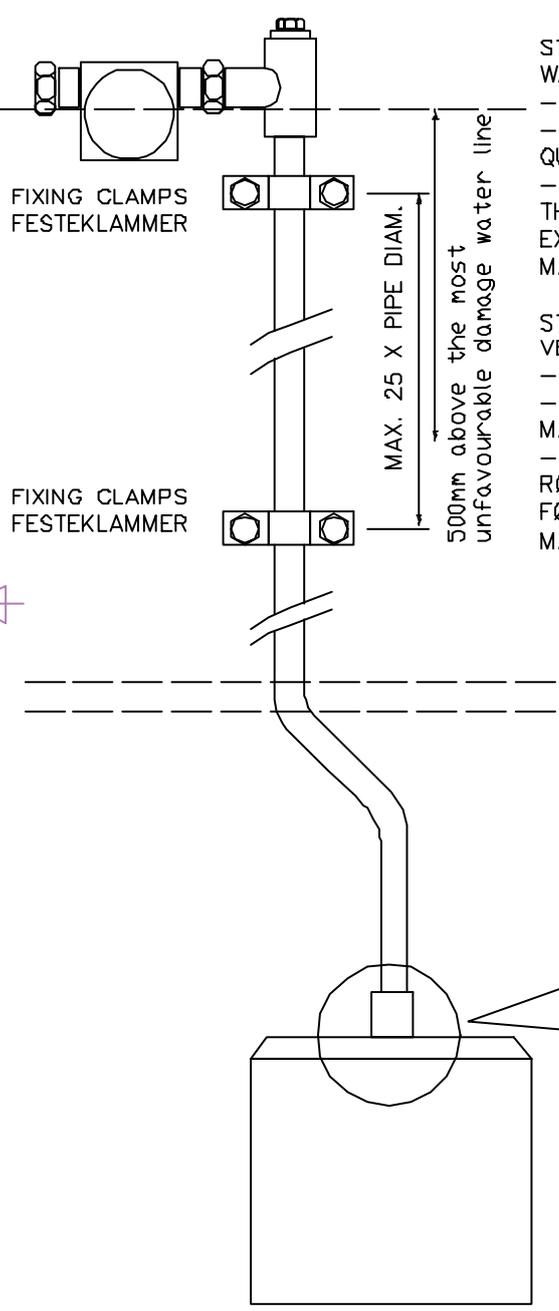
VEGGTYKKELSE:

- GALVANISERTE RØR: MIN. 6 MM
- SVARTE RØR: MIN. 10 MM

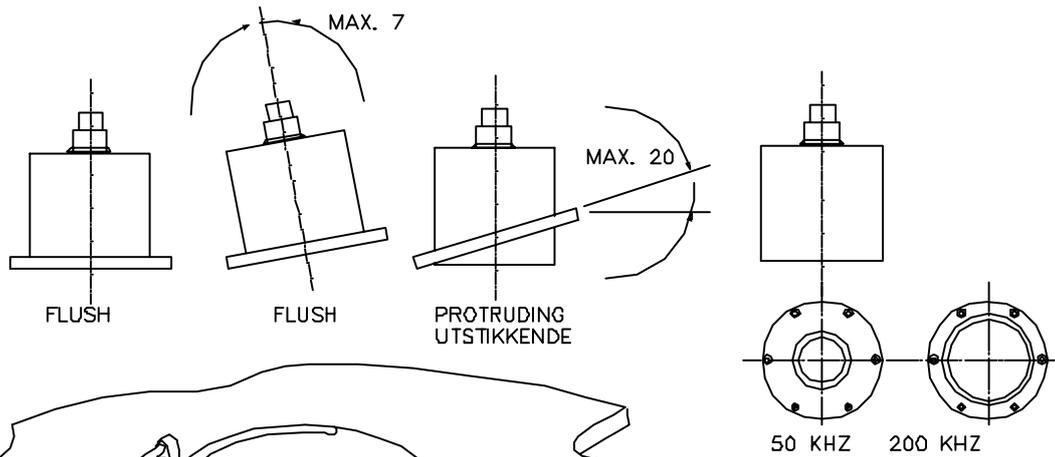
MATERIALKVALITET:

- SE VERITAS REGLER KAP. X. PARA 7A, TYPE III
- RØRET SVEISES INN MED TILSTREKKELIG EKSPANSJONSMULIGHET, FØR KABELN TREKKES.

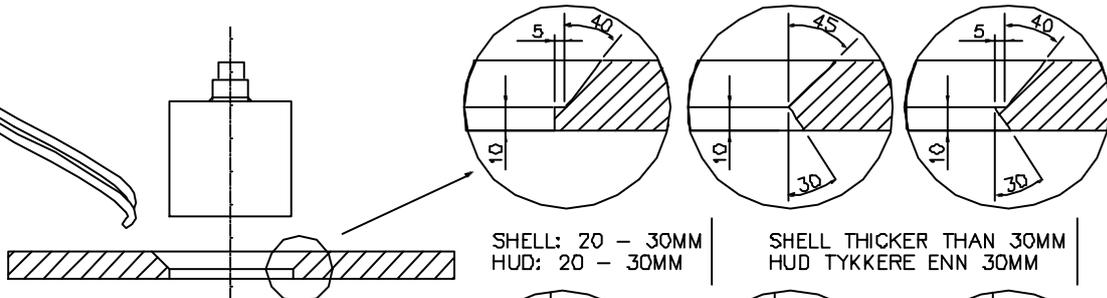
MAKS. KLAMMERAVSTAND PÅ RØRET, 25 X RØRDIA.



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date XXX - 10/00/00	File name TA3004	Date 00/10/00	Scale 1:1	
Skipper Electronics AS				Cable pipe for Transducertank		
				TA 3004	Edition 0	Sheet 1/1

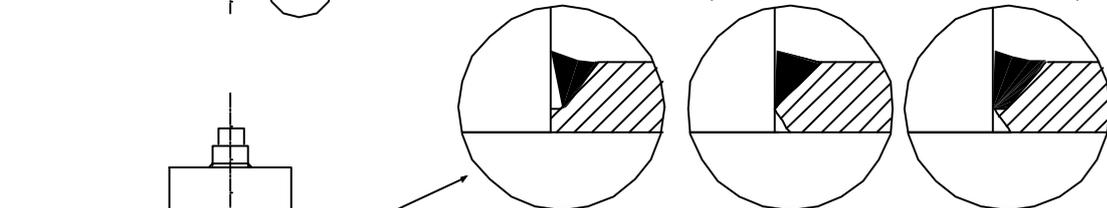


MATERIAL THICKNESS TOP AND SIDES: 20MM
MATERIAL TYKKELSE TOPP OG SIDER: 20MM



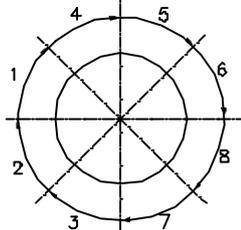
SHELL: 20 - 30MM
HUD: 20 - 30MM

SHELL THICKER THAN 30MM
HUD TYKKERE ENN 30MM

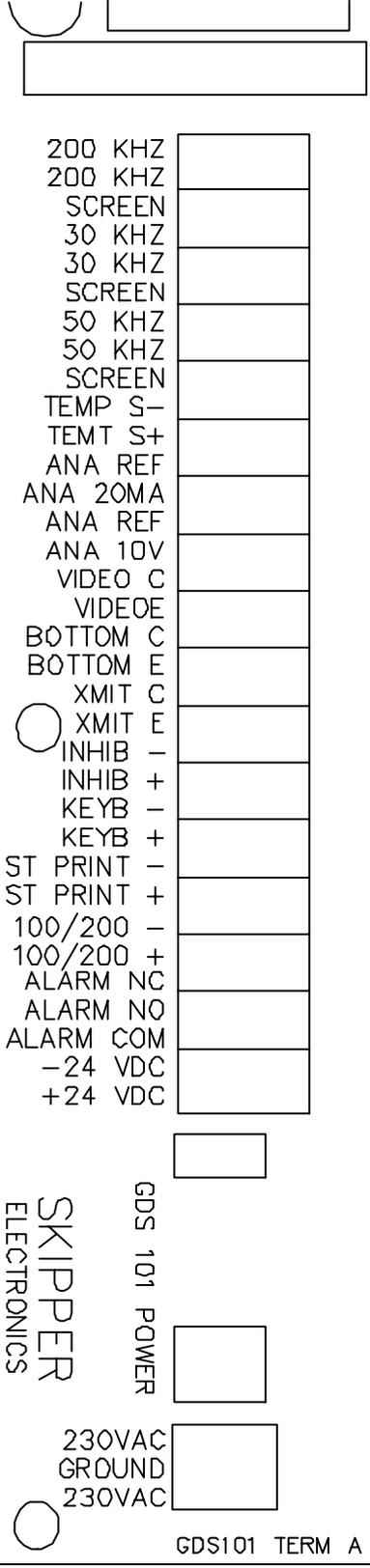
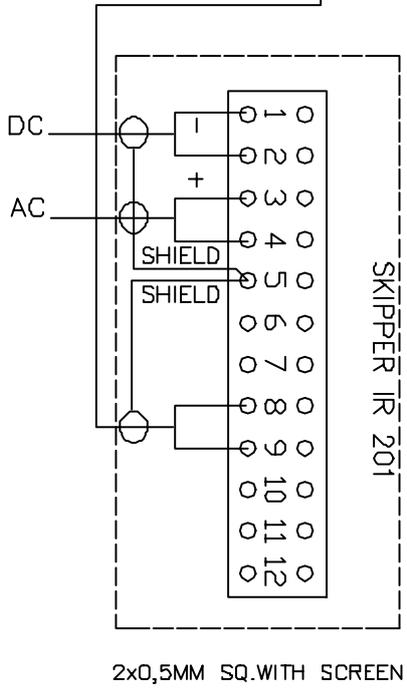
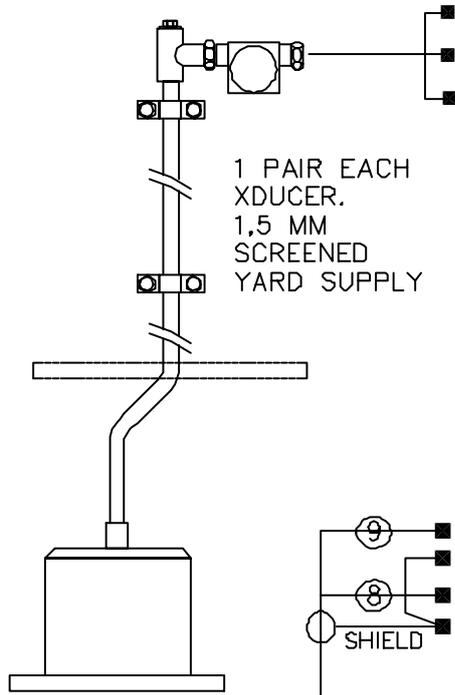


WELD THE TANK ACCORDING TO PROCEDURE AS SHOWN.
USE LOW-HYDROGEN ELECTRODES, E.G. OK 4800
IN ORDER TO AVOID CONTRACTION STRAIN, HAMMER EACH
WELDING SEAM BEFORE APPLYING NEXT. ALLOW THE TANK TO COOL
DOWN DURING WELDING.
DO NOT HAMMER THE LAST WELDING SEAM!
GRIND FLUSH ALL WELDINGS WITHIN 5 M IN FRONT OF, AND 3 M TO THE
SIDE OF THE TRANSDUCER. FINALLY, PAINT THE TRANSDUCER TANK INSIDE
AND OUTSIDE WITH A NON-CORROSIVE COATING.

SVEIS TANKEN I HENHOLD TIL VISTE PROSEDYRE.
BRUK LAVHYDROGEN-ELEKTRODE, F.EKS. OK 4800.
FOR Å UNNGÅ KRYMPESPENNINGER MEST MULIG, HAMRES HVER
SVEIESTRENG FØR NESTE LEGGES, OG TANKEN HOLDES SÅ KALD SOM
MULIG UNDER SVEISINGEN.
SISTE SVEIESTRENG MÅ IKKE HAMRES!
PLANSLIP ALLE SVEISESØMMER INNENFOR ET AREALE AV 5M I FRONT OG
3 M TIL HVER SIDE FOR SVINGEREN. TIL SLUTT MALES SVINGERTANKEN
UTVENDIG OG INNVENDIG MED KORROSJONSHINDRENDE MALING.



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date XXX - 10/00/00	File name TB3001	Date 00/10/00	Scale 1:1	
Skipper Electronics AS			TB 3001		Edition 0	Sheet 1/1



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference		
Designed by AM	Checked by VF	Approved by - date XXX - 10/00/00	File name TB3006	Date 00/10/00	Scale 1:1		
SKIPPER Electronics AS				TB3006		Edition 0	Sheet 1/1

TRANSUCER
CONNECTION TERMINALS

- 200 KHZ
- 200 KHZ
- SCREEN
- 38 KHZ
- 38 KHZ
- SCREEN
- 50 KHZ
- 50 KHZ
- SCREEN
- TEMP S-
- TEMT S+
- ANA REF
- ANA 20MA
- ANA REF
- ANA 10V
- VIDEO C
- VIDEQE
- BOTTOM C
- BOTTOM E
- XMIT C
- XMIT E
- INHIB -
- INHIB +
- KEYB -
- KEYB +
- ST PRINT -
- ST PRINT +
- 100/200 -
- 100/200 +
- ALARM NC
- ALARM NO
- ALARM COM
- 24 VDC
- +24 VDC

DC MAINS CONNECTION
TERMINALS

AC MAINS CONNECTION
TERMINALS

SKIPPER
ELECTRONICS
GDS 101 POWER

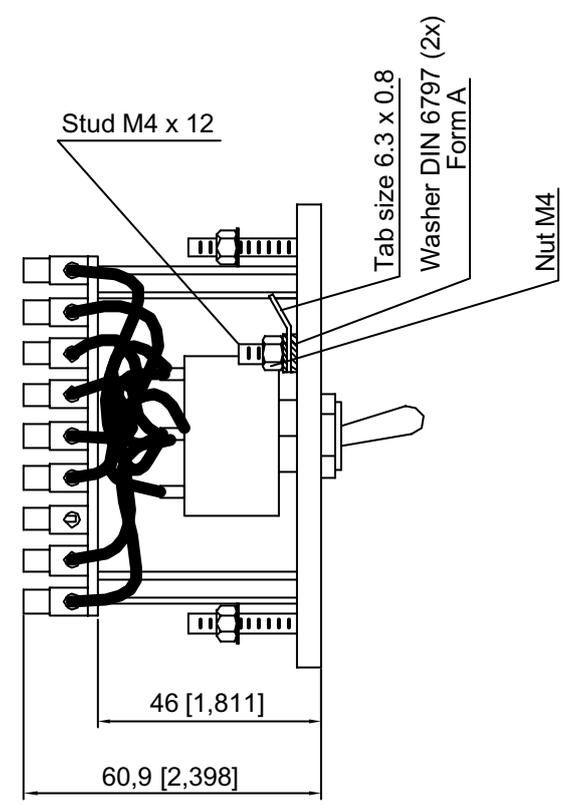
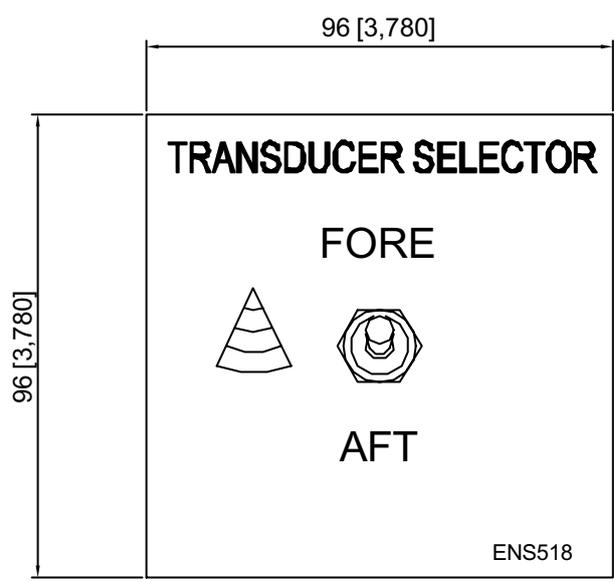
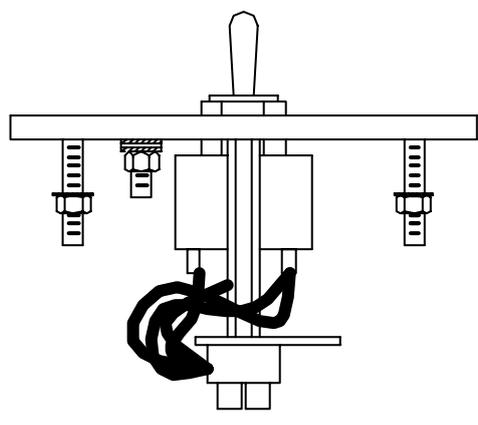
24 VDC
MAINS SWITCH

115/230 VAC
MAINS SWITCH

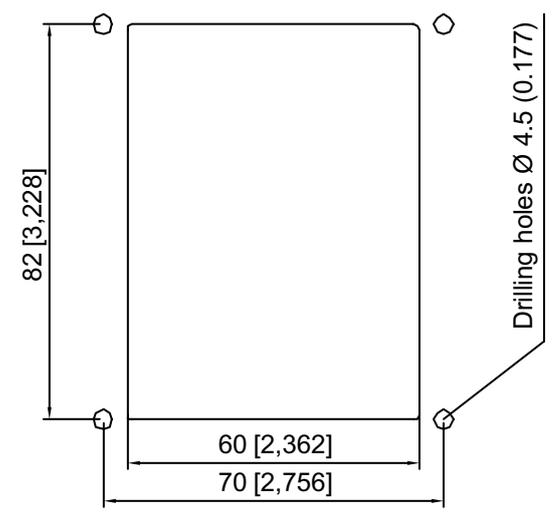
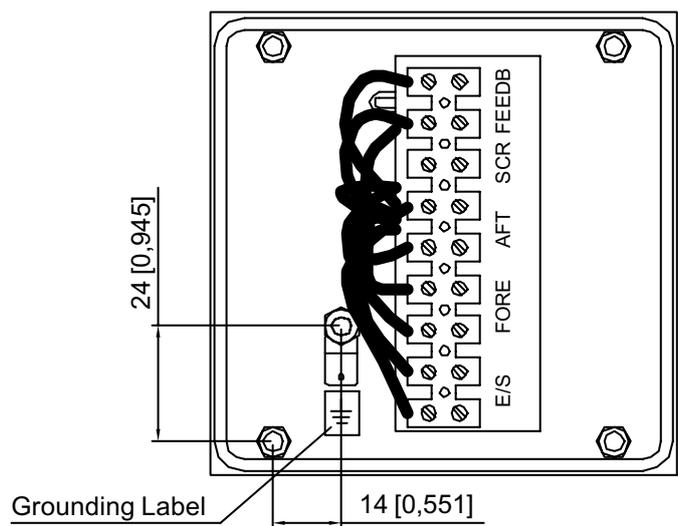
230VAC
GROUND
230VAC

GDS101 TERM A

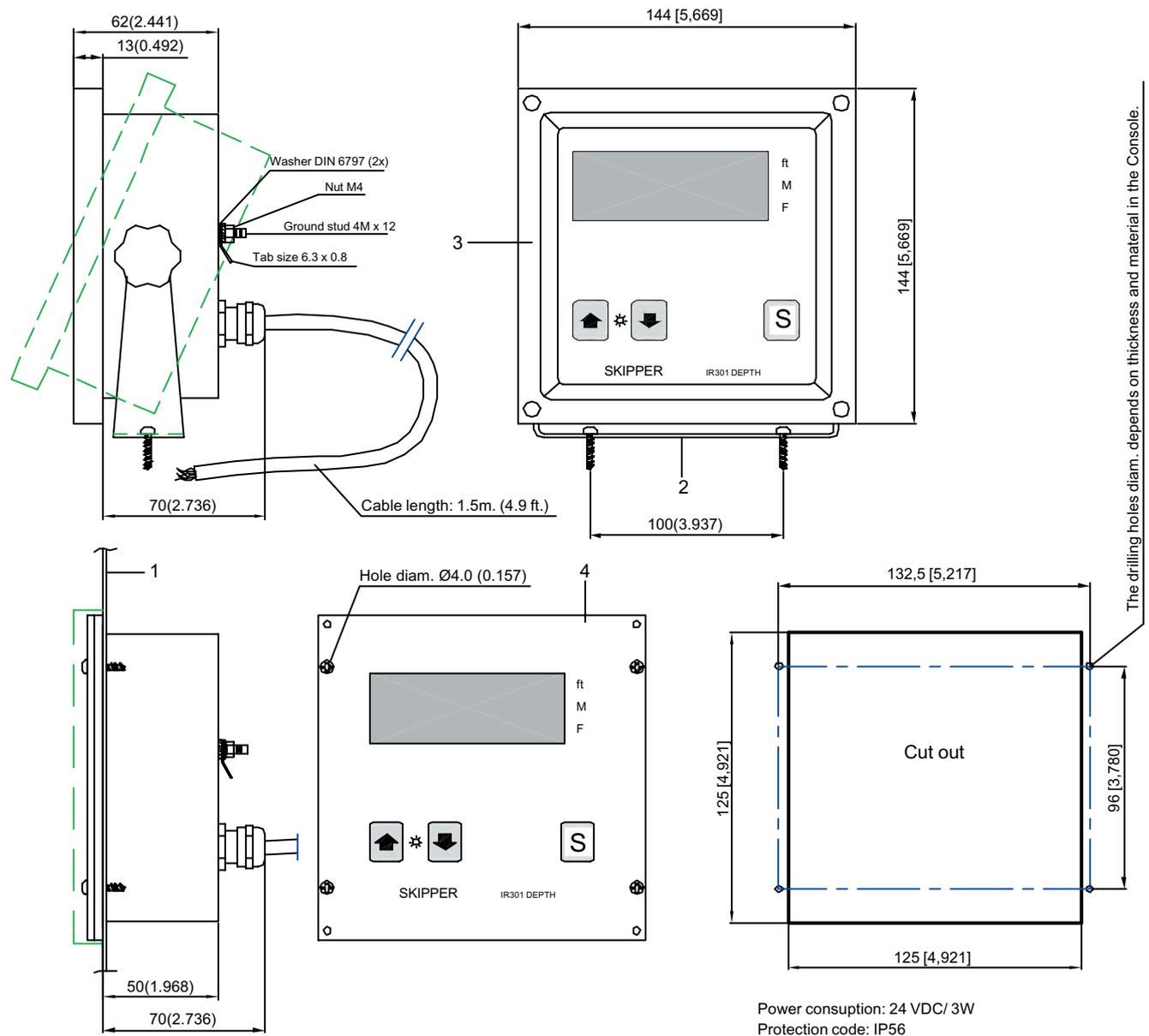
Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference		
Designed by AM	Checked by VF	Approved by - date XXX - 10/00/00	File name TB3005	Date 00/10/00	Scale 1:1		
Skipper Electronics AS				TB 3005		Edition 0	Sheet 1/1



Turned 180°



Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date VF-020815	File name ENS518	Date 020815	Scale 1:1	
SKIPPER Electronics AS			TRANSDUCER SELECTOR			
			ENS518		Edition I	Sheet 1/1



Power consumption: 24 VDC/ 3W
Protection code: IP56

WIRING CONNECTING			
COLOUR	SIGNAL	COLOUR	SIGNAL
RED	+ 24V	GREEN	DIM+
BLACK	- 24V	YELLOW	DIM-
BLUE	NMEA IN+	GREY	DIMKEY
WHITE	NMEA IN/OUT-		
ORANGE	NMEA OUT+		
GROUND WITH GROUND STUD			

Console mounting order:

- Make a cut out in the Console (1) 125 x 125 (4.921 x 4.921)
- Remove the mountingbracket (2)
- Unscrew the 4 screws in the frame (3) (one in each corner) and remove the frame.
- Put the Monitor(4) in the cut out and mark the 4 centerpoints for the Drill in the Console(1) (The drilling holes diam. depends on thickness and material in the Console.)
- Use Panh. screws DIN 7981 Diam. 2.9 (0.114). Length depends on the Console thickness.
- Finally put on the frame (3). Make sure that the screwheads correspond with the cut outs in the frame.

Console mounting, IP56 protection.

- Before fixing the monitor (4) in the cut out area in console (1), apply sufficient amount of water sealant compound between the monitor (4) and console (1).
 - Before the frame (3) is remounted, apply sufficient amount of amount of water sealant compound in the inner area of frame and on the edges of the monitor (4), to ensure that water can not penetrate into the monitor (4).
- The front panel of the monitor is waterproof.

Itemref	Quantity	Title/Name, designation, material, dimension etc			Article No./Reference	
Designed by AM	Checked by VF	Approved by - date VF-020815	File name TB3009W	Date 020815	Scale 1:1	
SKIPPER Electronics AS			IR301 DEPTH INDICATOR			
			TB3009W			Edition 0

