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Fig 1.1 Viser et GDF201 betjeningspanel
SVGA/TFT- Skjerm
PRINTER
HANDKONTROLLER
HOVEDENHET
SVINGERE

Fig 1.2 Systemdiagram
Funksjonen til de 6 soft-key knappene på toppen av håndkontrolleren avhenger av den aktive skjermen, og knappene er merket på den laveste delen av skjermen.

Lysstyrke
Dag / natt kontrast
Meny valg knapp
Fasing
Dybde område

GDF 201 KAN RESETTES VED Å SLÅ LODDET AV/PÅ OG HOLDE EN AV KNAPPENE PÅ FJÆRNSKONTROLLEN INNE TIL LODDET PIPPER 4 GANGER.
1. INTRODUCTION

SYSTEM SUMMARY.

GDF201 is a colour sounder with possibility for connection a TFT screen or a standard monitor. The display graphics is continuously shown on the screen along with complete fishery details. Printer/harddisk is available when a hard copy is required. Comprehensive interfaces are available including NMEA0183 input and output.

TRANSDUCERS.

GDF201 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.

MAIN UNIT

The main unit is normally mounted hidden. 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.

HAND CONTROLLER

The function of each soft-key button depends on the active screen, and the buttons are labelled on the lower rim of the screen. The display contrast may be adjusted by the user. The echo-gram is normally displayed continuously on the screen.

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 12 are calibration set-up and system supervision screens. The various screens will be described in detail later.

Fig. 1.1 shows the layout of a GDF201 Hand controller.

Fig. 1.1 Hand controller
Fig. 1.3: System Overview

- Navigator
- Speed Log
- Computer
- External Alarm
- External Printer
- Analogue Depth Information
- Color LCD Monitor / SVGA screen
- IR201 Repeater
- Cabinet
- Superstructur
- Hull
- External Keyboard
- Transducer (3 may be connected)

- PT200 Temperature Sensor Input
- 220VAC/24VD
- 1 pair each xducer, 2.5 mm screened Yard Supply
- Standard Supply except Yard Supply

- 100/200 ppm
- 0 - 10V / 4-20 mA

- NMEA
- Trigger/ Bottom
- (RS232 C)
INTERFACES

The GDF201 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.

**Alarms.**
Shallow and deep alarms may be selected from Screen 6. A potential free relay contact is provided in GDF201 for interface to external alarm systems.

**History Memory**
GDF201 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.

**Sound Speed Calibration**
This option will enable adjustment of the sound speed value used for the depth calculations.

**A Scope**
It is possible to adjust A SCOPE size on the screens right side.

**Bottom Expansion**
It is possible to adjust Bottom expansion size on the screens bottom or top side.

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.

**Remote Sounding Control.**
This option lets the GDF201 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.
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 3.

**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.

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. Press till the range is 500 m

**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 the screens in the sequence 1 to 13. Screens no. 1 - 4, covering the primary functions, may also be cycled by repeatedly pressing the “Menu” button.

The screen layouts are outlined in Fig. 2.1 through 2.13. The various Soft Key button functions are described with each screen.
Fig. 2.1  Screen 1, Primary Operation screen.

Soft Key 1  MENU  exit  exit MENU
Soft Key 2  GAIN  0 - 100%  Gain Adjustment
Soft Key 3  TVG  0 - 100%  Time Variable Gain Adjustment
Soft Key 4  POWER  0 - 100%  Transmitter power adjustment
Soft Key 5  THRESHOLD  1-7 step  Remove “faint color”
Soft Key 6  FREQUENCY  38/50/200  Transducer selection

FACTORY SETTINGS:

GAIN  50%
TVG  50%
POWER  50%
FAR GAIN  50%  RECOMMENDED SETTING 0 - 4 %
Fig. 2.2  Screen 2, 2nd Operation screen.

Soft Key 1  MENU  exit  exit MENU
Soft Key 2  EKSP.START  0.m.  aktivate with pelagic, see screen 3
Soft Key 3  EXP. RANGE  3m-100m
Soft Key 4  PICT.SPEED  m:s/div etc.  Unit of measurement for picture speed
Soft Key 5  MARKER1
Soft Key 6  MARKER2

Soft Key 5 and 6  Distance between vertical marker lines is calculated in displayed in the echogram window. If vessel speed is provided fro GPS, distance is measured in meters, otherwise - in time units.
Fig. 2.3  Screen 3, 3rd Operation screen.

Soft Key 1  MENU  exit  exit MENU
Soft Key 2  0m VRM  line, shows depth
Soft Key 3  EXP. TYPE  pelagic,bottom,hardness
Soft Key 4  EXP. WIND  placement on screen
Soft Key 5  EXP. SPLIT  size
Soft Key 6  A-SC. SPLIT  size  right side
Fig. 2.4   Screen 4, 4th Operation Screen

Soft Key 1   TRIP DIST.   reset
Soft Key 2   PRINT      printer must be connected
Soft Key 3   PULSE LEN   short, medium, long pulse length
Soft Key 4   FILTER      on/off noise reduction
Soft Key 5   RANGE       auto-range (A/B) /-shift, manual
Soft Key 6   SYSTEM      off Switch off System
Fig. 2.5  Screen 5, Split picture composition

<table>
<thead>
<tr>
<th>Soft Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft Key 1</td>
<td>MENU exit</td>
</tr>
<tr>
<td>Soft Key 2</td>
<td>not used</td>
</tr>
<tr>
<td>Soft Key 3</td>
<td>TRAWL MARK on and off</td>
</tr>
<tr>
<td>Soft Key 4</td>
<td>DIGIT small/large size of depth numbers</td>
</tr>
<tr>
<td>Soft Key 5</td>
<td>WHITE LINE on/off</td>
</tr>
<tr>
<td>Soft Key 6</td>
<td>EXP. LINE on/off</td>
</tr>
</tbody>
</table>

**Soft Key 3:** Trawl depth horizontal marker is implemented.

If trawl-processing unit (SIMRAD ITI, IMAGENEX TS331/333) is connected, xxDBS message is processed by GDF201 software and trawl position in water column is indicated as a horizontal line across echogram window. This option is enabled/disabled on screen 5 by TRAWL MARKER [on/off] button.
Fig. 2.6  Screen 6, Soundspeed and Alarm setting

Soft Key 1  exit MENU
Soft Key 2  DRAUGHT
Soft Key 3  SOUND  1400 - 1550m/s  Sound speed setting
Soft Key 4  MAX RANGE  Faster bottomtracking
Soft Key 5  ALARM  0-100m  Shallow water
Soft Key 6  ALARM  0-200m  Deep water
Fig. 2.7  Screen 7, Calendar and Clock setting

Soft Key 1  exit MENU  exit MENU.
Soft Key 2  LOCAL TIME  possible to adjust for local time, if gps is connected
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

Soft Key 2: Local time indication option has been implemented. The Local Time Zone in whole hours is adjustable at screen 7, soft key 8. This option is activated if GPS time information is available. If Local Time Zone parameter is set to 0, UTC is indicated.
Fig. 2.8  Screen 8, Language and Measurement setting

Soft Key 1.  MENU  exit  exit MENU
Soft Key 2  LANGUAGE  English etc.  Screen language selection
Soft Key 3  DEPTH  m etc.  Unit of measurement for depth
Soft Key 4  not used
Soft Key 5  VESSEL SPD  knots etc.  Unit of measurement for vessel speed
Soft Key 6  SOUND SPD  m/s etc.  Unit of measurement for sound speed
Fig. 2.9  Screen 9, Output and Transmit Control

Soft Key 1	MENU	exit
Soft Key 2	SLOW PRF
Soft Key 3	H LEVEL
Soft Key 4	L LEVEL
Soft Key 5	UPPER	0 - 98m
Soft Key 6	LOWER	0 - 99m

Soft Key 2: Slower PRF option is implemented to avoid secondary bottom reflection indicated in the upper part of the echogram. If this phenomenon is observed (at certain combination of water depth and range setting), one should set SLOW PRF [on] on screen 9. Factory setting: SLOW PRF [off]

Soft Key 3 and 4: Bottom signal level (hardness) message is implemented on the serial output. It can be activated on NMEA screen 12 by setting MESSAGE DBS* [on]. The format is: $SDDBS,,x.x,M,,F,s<cr><lf>. Where x.x is depth value in meters and s is a signal strength value (hardness) in a range of 1-9. Current hardware provides 8-bit digitized range. It is possible to calibrate signal strength values on screen 9. L LEVEL button allows adjusting signal amplitude (in the range of 0-255), which corresponds to value 1, while H LEVEL defines amplitude value, corresponding to level 9.
This screen shows list of received NMEA messages and half screen echo-gram.

Soft Key 1      REC.HOUR      select hour on the list
Soft Key 2      REC. MIN      select hour on the list
Soft Key 3      SELECT first   select playback of history
Soft Key 4      SELECT last    select playback of history
Soft Key 5      RECORDING     recording of history
Soft Key 6      PLAY BACK     play of recorded history

Soft key 1 - 6 is OPTION
Fig. 2.11  Screen 11, Screen History Memory Control

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

Soft Key 1  SCREEB  print screen
Soft Key 2  DRIVE  memory choice a/b/c/d
Soft Key 3  NOISE RED.  recording noise select
Soft Key 4  DELETE  deletes recorded history

Soft Key 5  not in use
Soft Key 6  not in use

HISTORY IS A OPTION
Fig. 2.12  Screen 12, Screen History Memory Control

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

- **Soft Key 1**: SCREEN  
  - print screen
- **Soft Key 2**: BUAD  
  - 4800/9600 baud rate
- **Soft Key 3**: IN / OUT  
  - nmea 0183 / rs232 choice
- **Soft Key 4**: MESSAGE  
  - DPT/DBS/DBT/DBK/DBS*
- **Soft Key 5**: STATUS  
  - on / off status of MESSAGE
- **Soft Key 6**: DISPLAY  
  - output / input displays on the screen
This screen shows list of received NMEA messages and half screen echo-gram.

### Soft Key 1
SCREEN
print screen

### Soft Key 2
PRINT TYPE
HP / BJC printer type

### Soft Key 3
ALARM
internal alarm on / off

### Soft Key 4
SETTINGS
factory/user1/user2/user3

### Soft Key 5
STORE
save settings you have made

### Soft Key 6
CALL
back to factory settings
Fig. 2.14 Screen 14, Screen History Memory Control

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

Soft Key 1 SCREEN
Soft Key 2 PARAM
Soft Key 3 PARAM
Soft Key 4 GAIN
Soft Key 5 TVG
Soft Key 6 POWER

print screen
jump to next parameter
change parameter settings
change of settings
change of settings (0% = max TVG)
change of settings
1. PRINCIPAL FUNCTIONS

BOTTOM DETECTION
GDF201 employ a bottom detection algorithm that will try to extract the bottom signal from all kinds of noise and secondary echoes. When GDF201 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 looses 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 12 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 4. 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.

THRESHOLD KEY
To display and erase colours from threshold.

MENU
The menu button facilitates selection of one of the 13 screens and soft key layouts. The 4 primary operation screens may be cycled by repeatedly pressing the MENU button. Access to the remaining screens is hold the press on MENU button.

CONTRAST ADJUSTMENT
Contrast button, for selected between Day/ Night colour.
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.

TVG 100% is min TVG  
TVG 0% is max TVG

**DIGITAL INDICATION**

On the operation screens, one size of large digital depth indicators.
**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 1 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 Print buttons switch continuos printing on and off.

**Alarm Settings**

Depth alarm settings are performed from Screen 6. Alarm limits are referred to the indicated depth.

The local alarm buzzer may be disabled from screen 12, 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 7. 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**

History function is a option, we need to install a Disk on module device. The length of recorded history depend of the size of the disk.

GDF201 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 10.

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 GDF201 (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.

**Simulator**

The GDF201 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 12. When the simulator is operating, “Demo” is flashing at the bottom of the screen.

**Status Screen**

The Status screen, Screen 12 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, Screen 13 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.

**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.

2. 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.

**Remote Sounding Control.**

This option lets the GDF201 being controlled remotely in synchronised, burst or single ping modes. If installed, this option is accessible on Screen 9.

**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 4.

When the printer is started, Auto Range is automatically disabled, and the present depth range is selected as fixed.
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.
TROUBLE SHOOTING

TYPICAL STATUS SCREEN (12) CONTENTS.
The Status Screen (12) 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 GDF201 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 GDF201 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.

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 (13) CONTENTS.
This Oscilloscope Screen (13) 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.
4. INSTALLATION

**Standard System Supply.**

A Basic GDF201 system consists of the following units. See Fig. 4.1:

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operator Unit</td>
</tr>
<tr>
<td>2</td>
<td>Handcontroller</td>
</tr>
<tr>
<td>3</td>
<td>TFT or SVGA monitor.</td>
</tr>
<tr>
<td>4</td>
<td>Transducer (s)</td>
</tr>
</tbody>
</table>

**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.
Fig 4.2 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, GDF201 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 110V | 0.5A 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 4. The unit is switched on by pressing any button.
HAND CONTROLLER INSTALLATION.
EXTERNAL PRINTER

The figure shows the connections of external units. These connections are located in the upper, left corner on the cabinet.

Fig. 4.4 External Printer connection
Use standard printer cable when connecting a external printer.

Color LCD Monitor/ SVGA Screen

The figure shows the connections of external units. These connections are located in the upper, left corner on the cabinet.

Fig. 4.5 Color LCD Monitor/ SVGA Screen connection
Connection through a 15-pins standard screen cable.
This connection gives the opportunity to receive information concerning position, course, speed and UTC from external sources through the NMEA0183- protocol.
Terminal Board

Fig. 4.4 Voltage selection connectors and fuses, Terminal Board.
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. 4.5 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: Transceiver 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.

Connect transformer primary to J102 for 230V AC or to J103 for 115V AC.

Fit protection plug on unused connector.

Analogue Current Output "ANA DEPTH 4-20" must be terminated by max 470R for proper operation of the analogue depth outputs.

DC Power Supply 24V 2A 40-50W

Use Marine Twisted Fair Installation Cable for all Signal cabling.

Alarm Feed
COM: Common
NO: Normally Open
NC: Normally Closed

Log Signal 100 or 200 pulses per nM

Remote printer start
Remote Keyboard
Remote Inhibit Syncronisation

Xmitter Pulse emitter (E) collector (C)
Receiver Video emitter (E) collector (C)

Analoge Depth 0 - 10V

Analoge Depth 4 - 20mA

FT 200 Temperature Sensor

Xducer Cabling:
1.5 mm sq. screened, Yard Supply

Xducer: Screen

17 pcs. COB5/1
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 9 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 4 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**

GDF201 is equipped with analogue outputs to supply analogue repeaters or other equipment with ana-
logue inputs. The signals are galvanically connected to the GDF201. Standard range is 0 - 10V or 4 - 20mA corresponding to Shallow Max, Deep Max Settings. These settings may be accessed on Screen 9.

See Fig. 4.7.

Analogue outputs from the GDF201 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 11 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. 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 SOUNDING CONTROL.
This option lets the GDF201 being controlled remotely in synchronised, burst or single ping modes. If installed, these options are accessible on Screen 9.
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 9 for selection of the control signal polarity.
5. START-UP AND SYSTEM ADAPTATION

SYSTEM ADAPTATION

ANALOGUE OUTPUT AND LOG PULSE INPUT RANGE SELECTION.
From Screen 9 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.

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 6.

LANGUAGE AND UNITS OF MEASURE
From Screen 8 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 9:

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 11 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 GDF201 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 GDF201 and interpreted by the program. The talker identifier is ignored:

**Time**

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

**Position**

- Geographical Lat/Lon: GLL,xxxx.xx,N,xxxx.xx,W
- Geographical Fix, present: GXP,xxxxxxx,xxxx.xx,N,xxxx.xx,W,cccc,x
- Omega Fix, present: GOP,xxxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
- Loran C Fix, present: GLP,xxxxxxx,xxxx.xx,N,xxxx.xx,W,cccc
- GPS Position: GGA,xxxxxxx,xxxx.xx,N,xxxx.xx,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,xxxxxxx,a,xxxx.xx,N,xxxx.xx,W,xx.x,xxx.,xxxxx.,*xx
- Vessel Identification: IMA,aaaaaa,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 11 and dependant on the DRAUGHT setting). The messages are enabled individually. Transmitted talker identifier is SD, Sounder Depth:

- Depth & Draught: SDDPT,xxxx.x,xxxx.x
- Depth below surface: SDDBS,xxxx.x,f,xxxx.x,M,xxxx.x,F
- Depth below transducer: SDDBT,xxxx.x,f,xxxx.x,M,xxxx.x,F)
- Depth below keel: SDBBK,xxxx.x,f,xxxx.x,M,xxxx.x,F)
PERFORMANCE

Depth Range: 10 - 1600 m
Graphic resolution: 0.5% of Range
Digital resolution: <10 m: 0.1 m
≥10 m: 1 m
Max. Power 2kW

Transducer, 38 kHz Effective Range 1600m
Transducer, 50 kHz Effective Range 1000m
Transducer, 200 kHz Effective Range 500m

ENVIRONMENTAL

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

Operator Unit Cabinet
Supply voltage: 24V DC (20-32V)
Power consumption: 50W at 24V, 70W at 220V
Alarm relay: Change-over contact, max. 24V 300 mA
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.
**Options**

**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 9. The following function options are available on Screen 3:

<table>
<thead>
<tr>
<th>PING</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>continuos</td>
<td>Transmitter operation is continuos and not affected by the external signal.</td>
<td></td>
</tr>
<tr>
<td>edge</td>
<td>The transmitter is activated once by an active signal edge.</td>
<td></td>
</tr>
<tr>
<td>level</td>
<td>The transmitter is controlled by the external signal level. An active level keeps the transmitter running, a passive level stops the transmitter.</td>
<td></td>
</tr>
<tr>
<td>single</td>
<td>The transmitter is activated ping by ping by pressing the PICTURE SPEED button on the Operator panel. The external INHIBIT signal is disabled.</td>
<td></td>
</tr>
</tbody>
</table>
6. CONFIGURATION OF TRANSMITTED POWER LIMITS.

Some Transducers will not tolerate the power (Voltage levels) given by the GDF 201. The Units with serial number 081163 onwards have a facility to force the maximum power settings. Reducing the risk of causing damage.

Software requirements:
GDF201 sw version from 3.01.02
STARTUP.EXE utility version from 1.01.12

1. To enter GDF201 configuration mode:
   • Switch off the mains inside the cabinet.
   • Press “Brightness” key on the remote keyboard, switch on the mains and keep the brightness key pressed until you see the message “You may release hidden button” on the screen.

2. After few diagnostic messages, 6 soft-keys will appear in the lower part of the screen. Five soft keys (1-5) allow setting the maximal transmitted power at each of 3 transceiver channels (38/50/200 KHz).

3. The softkeys on the screen correspond to the push buttons in the upper row of the remote keyboard. Note, that it does not matter which key (“up” or “down” is pressed).

4. By setting ON “–3db” softkey, the maximal transmitted power, will be reduced by the factor of 2 (50% of maximal). By setting ON “–6db” softkey, the maximal transmitted power will be reduced by the factor of 4 (25% of maximal). By setting ON both “–3db” and “–6db” softkeys, the maximal transmitted power will be reduced by the factor of 8 (12.5% of maximal). Note, that by maximal transmitted power is meant the power, which corresponds to 100% setting on GDF201 operator panel

<table>
<thead>
<tr>
<th>-3dB</th>
<th>-6dB</th>
<th>% of full power</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>100%</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>50%</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>25%</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

5. Note, that for channel 38KHz only “–6db” selection is available.

6. After the power limits have been set as desired, press “Continue” button. Configuration will be written into the executable file and will not be changed by Master Reset procedure.
### 7. SPECIFICATIONS

#### DIMENSIONS

<table>
<thead>
<tr>
<th>Component</th>
<th>Height, front</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator unit cabinet</td>
<td>340 mm</td>
<td>320 mm</td>
<td>170 mm</td>
<td>approx. 10 kg</td>
</tr>
<tr>
<td>Hand controller</td>
<td>87 mm</td>
<td>147 mm</td>
<td>26 mm</td>
<td>approx. 0.2 kg</td>
</tr>
<tr>
<td>Operator Unit Cabinet, Cut-out for flush Mounting</td>
<td>322 x 302 mm</td>
<td></td>
<td></td>
<td>4 mm</td>
</tr>
<tr>
<td>Operator Unit Cabinet, Space for Paper Replacement</td>
<td>Below opened Door</td>
<td>70 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### FUNCTIONAL PROPERTIES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Scope</td>
<td>A-Scope on the right side</td>
</tr>
<tr>
<td>Bottom Expansion</td>
<td>Bottom expansion on the screen</td>
</tr>
<tr>
<td>Depth Alarms</td>
<td>Deep and shallow Limits</td>
</tr>
<tr>
<td>Sound speed</td>
<td>Sound speed calibration</td>
</tr>
<tr>
<td>Calendar/Clock</td>
<td>Year-Month-Day / Hours-Minutes-Seconds (24 hour system)</td>
</tr>
<tr>
<td>Interface Outputs</td>
<td>Trigger- and Bottom-Pulses.</td>
</tr>
<tr>
<td></td>
<td>analogue 4-20 mA and 0 - 10 V for Depth. Detected Video</td>
</tr>
<tr>
<td></td>
<td>NMEA 0183 for Depth</td>
</tr>
<tr>
<td></td>
<td>Alarm Relay</td>
</tr>
<tr>
<td></td>
<td>Output for VGA Repeater</td>
</tr>
<tr>
<td></td>
<td>RS-232 C</td>
</tr>
<tr>
<td>Interface Inputs</td>
<td>100/200 Pulses for Speed</td>
</tr>
<tr>
<td></td>
<td>NMEA0183 for Speed, Position, Heading and Time</td>
</tr>
<tr>
<td></td>
<td>Temp. Sensor Input</td>
</tr>
<tr>
<td></td>
<td>Remote Printer Start</td>
</tr>
<tr>
<td>Languages</td>
<td>English, French, Spanish, Russian, German and Norwegian</td>
</tr>
<tr>
<td>Options</td>
<td>SKIPPER IR201 digital remote depth Indicator.</td>
</tr>
<tr>
<td></td>
<td>LCD Repeater</td>
</tr>
<tr>
<td></td>
<td>Remote Keyboard for use with Repeater</td>
</tr>
<tr>
<td></td>
<td>Dual Frequency Screen</td>
</tr>
<tr>
<td></td>
<td>Remote Sounding Control</td>
</tr>
<tr>
<td></td>
<td>Auto Range</td>
</tr>
<tr>
<td></td>
<td>Supply voltage: 220V or 110V AC</td>
</tr>
</tbody>
</table>
8. 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.

Please find your local dealer at www.skipper.no.