LEVEL HUNTER II

Level & Pump Controller
Instruction Manual

JAN 2011 EDITION

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ECHO Process Instrumentation, Inc.

LEVEL HUNTER II MANUAL

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Chapter 1 Product Specification

Range	**: Model**
8m (26.2 ft) range	: Level Hunter II + XDS08 transducer
12m (39.3) range	: Level Hunter II + XDS12 transducer
15m (49.2) range	: Level Hunter II + XDS15 transducer

Physical

Dimensions	**Controller**	9.45" (W) X 7.28" (HT) (240 X 185 mm)
	Sensors	XDS08: Ø 2.64"(dia) X 2.3"(height) (Ø 67(dia) X 160(height) mm)
		XDS12: Ø 3.31"(dia) X 6.0"(height) (Ø 84(dia) X 152(height) mm)
		XDS15: Ø 4.53"(dia) X 6.8"(height) (Ø 84(dia) X 173(height) mm)
	Mounting	1" NPT
	Weight	Aprox. 9 lbs (4.0kg)
	Sensor material	Polypropylene

Environmental

IP Rating (electronics housing)	NEMA 4X (IP65)
Max. & Min. temperature (electronics)	-4˚ to +140˚F (-20 to +60°C)
Max. & Min. temperature (transducer)	-4˚ to +158˚F (-20 to +70°C)

Performance

Accuracy	0.20% of the measured range
Resolution	1mm
Max. range	XDS 08: 26ft (8m), XDS 12: 40ft (12m), XDS 15: 49ft (15m)
Min. range	XDS 08: 1.15ft (0.35m), XDS 12 & XDS 15: 1.6ft (0.50m)
Beam Angle	8^{o} at -3dB
Damping Rate	Adjustable from 0.1m/min to 100m/min
Temp. Comp.	Fully compensated via integral temperature sensor over entire operational span
Explosion Proof	EEX d II T6

Outputs

Analog output	4-20mA into Max 750Ω (user adjustable)
	Fault condition Alarm 3.8mA or 21mA user selectable.
Display	2 Line 40 Characters LCD

Programming

Programming	via 4 tactile push button keys

Supply

Power supply	90 ~260VAC (Free Voltage), 24VDC (Option)

Certificate

CE

Chapter 2 Installation

Power Supply Requirements

The LEVEL HUNTER II Series operate from an AC supply of 90 –260V or DC 24V.

> *All electronic products are susceptible to electrostatic shock, so follow proper grounding procedures during installation.*

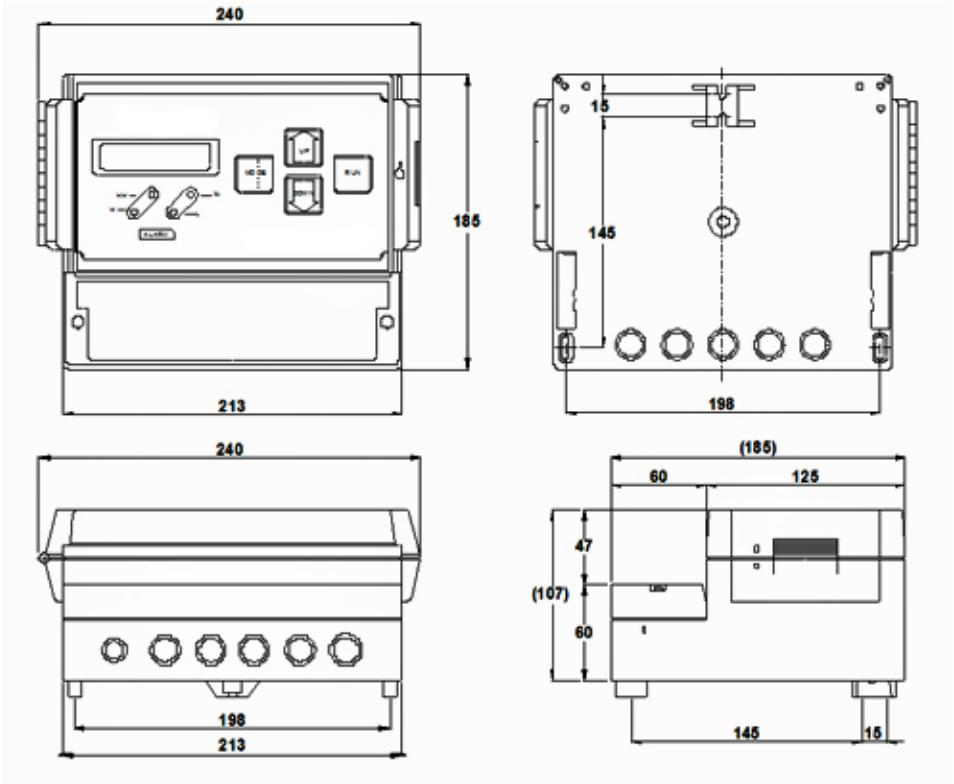
The XDS Series Transducers can be mounted easily using the thread (1”NPT).

When choosing a location to mount the Level Hunter II, bear in mind the following:

- For easy access to the LCD display and programming buttons mount it where it is easily accessible.
- The ultrasonic signal path should be free of falling material and obstructions such as pipes, beams etc.
- The XDS08 / XDS12 & XDS15 (Sensor) should be mounted at least 13.8 / 19.7 inch (35/ 50cm) above the maximum level of the material and be perpendicular to the surface.
- The mounting surface should be vibration-free.
- The ambient temperature of the sensor is between -4ºF and 158ºF.
- There should be no high voltage cables or electrical inverters close by.
- Do not use any metal substances when installing
  (Please use the PVC nut & flange supplied as option)

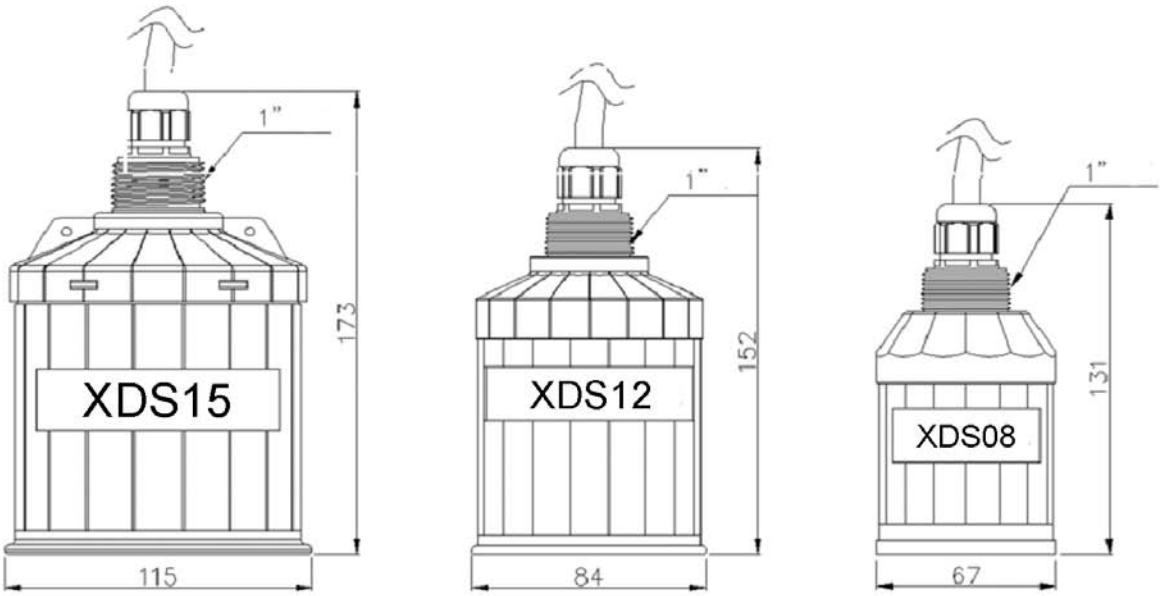
Dimensions

LEVEL HUNTER II



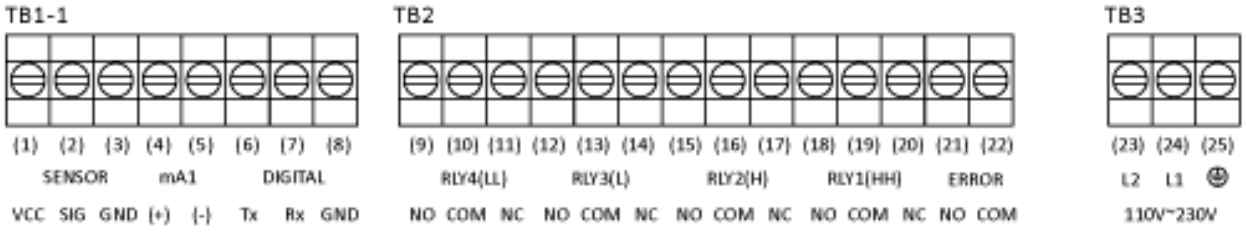
XDS08 / XDS12 / XDS15

ECHO XDS Sensor is a non-contacting level sensor which uses the sound energy created by a piezo ceramic. It is designed as a beam focusing form by original ECHO technology. The characteristic of beam focusing form is that the radiate surface of ultrasonic is hollowed and around the surface the sound whole is wheeled. The effect from the obstruction can be minimized and it has the effect to protect condensation.
XDS sensor is an exclusive sensor for the LEVEL HUNTER II Controller. The standard cable length is 10m.



Terminal Connection

Input & Output Terminals



Function

Termina l	Function		Note
VCC	1	Connect to positive wire (red) of ultrasonic sensor	
SIG	2	Connect to signal wire (white) of ultrasonic sensor	
GND	3	Connect to shield wire (black) of ultrasonic sensor	
mA+	4	4~20mA current output (positive)	Maximum :750Ω
mA-	5	Current output return (negative)	
TX	6	RS232C interface in use, connect to reception part RS485 interface in use, connect to Y	OPTION
RX	7	RS232C interface in use, connect to transmission part RS485 interface in use, connect to Z	OPTION
GND	8	GROUND, RX, TX	
RLY4_NO	9	Lower limit relay point, OFF with LL_COM together in operation	Low Low
RLY4_COM	10	Lower limit relay point, OFF with LL_NO together in operation	
RLY4_NC	11	Lower limit relay point, OFF with LL_COM together out of operation	
RLY3_NO	12	Lower Alarm relay point, OFF with L_COM together in operation	Low
RLY3_COM	13	Lower Alarm relay point, OFF with L_NO together in operation	
RLY3_NC	14	Lower Alarm relay point, OFF with L_COM together out of operation	
RLY2_NO	15	Upper Alarm relay point, OFF with H_COM together in operation	High
RLY2_COM	16	Upper Alarm relay point, OFF with H_NO together in operation	
RLY2_NC	17	Upper Alarm relay point, OFF with H_COM together out of operation	
RLY1_NO	18	Upper limit relay point, OFF with HH_COM together in operation	High High
RLY1_COM	19	Upper limit relay point, OFF with HH_NO together in operation	
RLY1_NC	20	Upper limit relay point, OFF with HH_COM together out of operation	
ER_NO	21	Error relay point, OFF with ER_COM together in operation	
ER_COM	22	Error relay point, OFF with ER_NO together in operation	
L2	23	Connect to line of AC power	Option: DC ver.
L1	24	Connect to line of AC power	
	25	Ground	

Quantity of cables gland provided and the cable thickness

Model	Quantity	Thickness(ømm)
PG11	4	5~10
PG13.5	1	6~12

Outdoor and Open Vessel Installation

The XDS08/XDS12/XDS15 can be simply mounted on a bracket, suitable for the application and secured using the thread located at the top of the transducer (1" NPT).

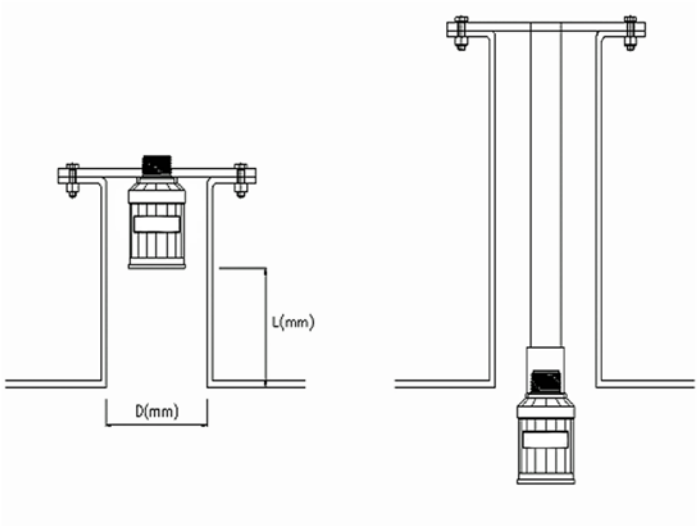
Care should be taken to ensure that the XDS08/XDS12/XDS15 is shielded from direct sunlight, in order to minimize errors in the measurement of ambient temperature.

Attention should also be taken, when mounting the unit, to ensure that strong windy conditions are avoided, wherever possible, to prevent abnormal operation.

Closed Vessel Installation

The XDS08/XDS12/XDS15 can be simply screwed into a flange and secured using the thread located at the top of the transducer (1"NPT).

Where possible use a flange made of a synthetic material such as PVC, to avoid vibration
Place a rubber gasket between the flange and the connection to the vessel to avoid vibration.

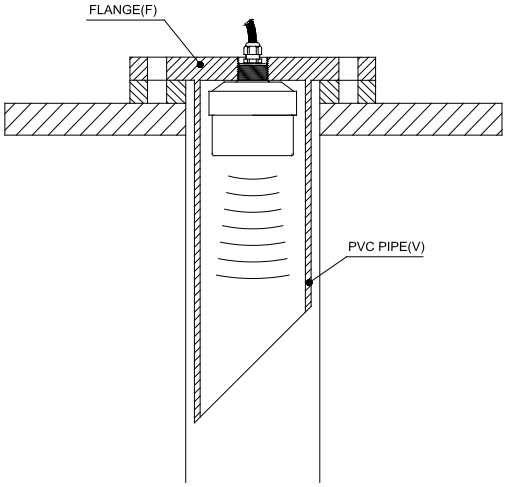


Stand Pipe Installation

When mounting the XDS08/XDS12/XDS15 to a standpipe care should be taken to ensure that the standpipe is of sufficient diameter with reference to its length, see the table below for details:

When using a standpipe, fixed to the top of a vessel, ensure that the open end of the standpipe is clear of any obstructions such as weld seams, gaskets etc. in order to avoid unwanted signal returns.

If using standpipes, which extend into the vessel, beyond the blanking distance, but not as far as the empty level, then the open end of the standpipe should be cut to an angle of 45°.



D [inch]	Standpipe Max Length (inch)		
	XDS08	XDS12	XDS15
3	7	-	-
4	9	9	-
6	13	13	13
8	18	18	18

Chapter 3 How To Use Level Hunter II

Operating the Controller

Display Window

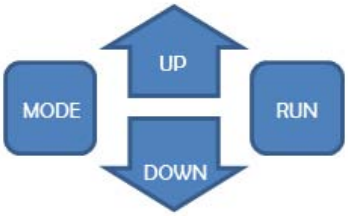
LEVEL HUNTER II is designed to display various data at the same time.
The display below shows an example of a normal operation of the Level Hunter II.

L: 6.44ft	**D: 1.56ft**	**D T**
M: 80.5%	**TEMP:+24.5℃**	

1) L : 6.44 ft : shows the current liquid level
2) D : 1.56 ft : shows the distance between the sensor bottom and the surface of the liquid.
3) M : 80.5% : Percentage of the level in the storage.
4) TEMP : Temperature around the sensor.
5) D : Indication of normal operation, shows returning echoes are well detected.
6) T : Indication of normal operation, shows tracking of returning echoes is okay.
7) S :No appearance under normal operation, but appears during abnormal operation such as abrupt level change. Searching for returning echoes.

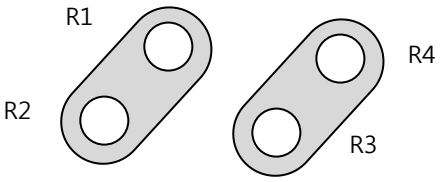
Setting Buttons

1) MODE Button: Used for setting data and moving to another mode.
2) UP Button: Used for increasing the value.
3) DOWN Button: Used for decreasing the value.
4) RUN Button: Used for starting measurement.



Alarm Display

1) R1 LED Lamp: Lighted in case of upper setpoint operated
2) R2 LED Lamp: Lighted in case of upper setpoint operated
3) R3 LED Lamp: Lighted in case of lower setpoint operated
4) R4 LED Lamp: Lighted in case of lower setpoint operated



Chapter 4 Menu Guide

Common menu setting

1) Sensor Type

SENSOR TYPE
***TYPE – 12M**

This option sets the sensor range. According to the measuring range, the sensor can be selected in three different models:

Option	
8m	Measuring range up to 8 meter (26 ft)
12m	Measuring range up to 12 meter (40 ft)
15m	Measuring range up to 15 meter (50 ft)

1) Measure Type

MEASURE TYPE SET
***LEVEL**

This option sets the mode of operation when in run mode, and can be set to one of the following:

Transducer	Setting option	Factory set
XDS08/ XDS12/ XDS15	Level	Level
	Distance	
	Space	

Option	Description
Level	Display shows how full the vessel is with respect to the **Empty** (0% of Span)
Distance	Display shows the distance from the transducer face to the surface.
Space	Display shows how an empty vessel is with respect to **Full** (100% of Span) i.e. how much space is available in the vessel.

- According to the choice of the option, the distance set point can be changed by the current output or relay output so that if the measure mode is changed, the distance value should be set again.
- The instruction manual from this point is given based on the Level option.

2) Bottom Distance

02. BOTTOM DISTANCE SET
BOT : 26 ft

This option sets the maximum distance from the face of the transducer to the empty point.

Transducer	Setting range	Factory set
XDS 08	0.98 – 27.8 ft	26.25 ft
XDS 12	1.64 – 41.0 ft	39.37 ft
XDS 15	1.64 – 50.8 ft	49.21 ft

3) Dead Band

03. DEAD BAND
DEAD: 1.15 ft

The transducer must be installed higher than maximum level. It is the distance between the maximum level and the face of the transducer.

Transducer	Setting range	Factory set
XDS 08	0.98 – 27.8 ft	26.25 ft
XDS 12	1.64 – 41.0 ft	39.37 ft
XDS 15	1.64 – 50.8 ft	49.21 ft

4) 4mA Set point

04. 4mA POINT
4mA : 0.00 ft

This option sets the level (or distance or space, depending on the selected **Measure Type)** at which the 4mA output will occur. By default 4mA will represent **Empty** (0% of Span).

Transducer	Setting range	Factory set
XDS 08	0 – 27.8 ft	0.00 ft
XDS 12	0 – 41.0 ft	0.00 ft
XDS 15	0 – 50.8 ft	0.00 ft

5) 20mA Set point

05. 20mA POINT SET
20mA : 6.00m

This option sets the level (or distance or space, depending on the selected **Measure Type)** at which the 20mA output will occur. By default 20mA will represent **Full** (100% of Span)

Transducer	Setting range	Factory set
XDS 08	0 – 27.8 ft	24.6 ft
XDS 12	0 – 41.0 ft	37.7 ft
XDS 15	0 – 50.8 ft	47.5 ft

Important Information
The Span **is the maximum working distance from** Empty **(0%) to** full **(100%), and is automatically calculated as** Empty Level **(Bottom Distance)** minus Blanking Distance. **Except for when Measure type = Distance;** in this case the Span is the same **as the** Empty Level.

6) Transmitting Power

06. TRANSMITTING POWER
POW : 3 (NORMAL)

This option is used to set the power output from the transducer to suit varying applications. By reducing the power emitted the beam angle will be effectively reduced and can be applied as detailed below;

- Setting Range:
  1(V WEAK) = Minimum Power (For use on short range applications)
  2(WEAK) = Low Power
  (For use on applications where obstructions such as pipes, beams, etc. are present)
  3(NORMAL) = Normal Power (For use in normal condition)
  4(STRONG) = High Power
  (For use in arduous applications where conditions are dusty, steamy or turbulent)
  5(V STRONG) = Maximum Power
  (For use in the applications to be expected diffused reflection)

7) Detection Threshold Voltage

07. DETECTION THRESHOLD
LEV : 6 (0.6V)

This option determines detectable size of return echo. This is useful when the first return echo is needed in condition where small objects creating various kinds of return echoes exist. In case the value is set high, it can be stronger to ignore noise, but may not be able to detect small echoes (possibly true echo). The 4 is equal to 0.3V. The table below shows the equivalent voltage to each value.

Transducer	Setting range	Factory set
XDS08/XDS12/XDS15	4(0.4V) -15(1.5V)	6

08) Damping Rate

08. DAMPING RATE
1.0 m/min

This option determines the maximum rate at which the unit will respond to an increase/decrease in level.
- Setting Range: 0.01 … 100 m/min (increment 0.01)

09) Error Current Set

09. ERROR CURRENT SET
SET: 3.8mA

If the XDS08/XDS12/XDS15 fails to receive a valid echo return from the target, then the mA output can be used to indicate a fault condition (Lost of Echo)

Transducer	Setting option	Factory set
XDS08/XDS12/XDS15	3.8mA	3.8mA
	HOLD	
	21.0mA	

10) Fail Safe Time

10. FAIL SAFE TIME
TIME: 300 sec

In the event of a fail-safe condition occurring (Lost of Echo) the fail safe timer determines the time before the mA output indicates a fault condition (Lost of Echo)

Transducer	Setting range	Factory set
XDS08/XDS12/XDS15	20 - 999	300

11) mA Output Test

11. mA OUTPUT TEST
OUTPUT: HOLD

This option is used with other equipments for testing.

Transducer	Setting range	Factory set
XDS08/XDS12/XDS15	HOLD (Current output)	HOLD
	4mA	
	12 mA	
	20 mA	
	3.8 mA	
	21 mA	

12) Distance Unit Setting

12. DISTANCE UNIT
UNIT: m (METER)

This option determines system unit

Transducer	Setting range	Factory set
XDS08/XDS12/XDS15	M (METER)	M (METER)
	F (FEET)	

13) Detection Algorithm

13. DETECT ALGORITHM
TYPE: FIRST ECHO

This option determines the echo when there are many echoes reflected.
If “FIRST ECHO” is set, it will detect and lock on the first returned echo.
If “MAXIMUM ECHO” is set, it will detect the maximum echo among the returned echoes.
However, this method is used on the condition that the difference in voltage between the maximum echo and other echoes should be less than 0.5V. This method is useful where smaller objects are near the target.

Transducer	Setting range	Factory set
XDS08/XDS12/XDS15	FIRST ECHO	FIRST ECHO
	MAX ECHO	

14) Sound Speed

14. SOUND SPEED
SPEED : 331.5 m/s

This option allows for the velocity of sound to be changed according to the atmosphere the transducer is operating in. By default the velocity is set for sound traveling in air at a temperature of 0°C.

The table below gives details of the velocity of sound in various gaseous atmospheres In all cases the velocity indicated is that in a 100% gaseous atmosphere at 0°C. In atmospheres less than 100% it may be necessary to check the level indicated at near empty and near full and compare with the actual level, several times, then adjust the **Sound Speed** accordingly to obtain an accurately displayed reading.

Gas	Sound Velocity
Chlorine	206 m/sec
Carbon Dioxide.	259 m/sec
Argon	308 m/sec
Oxygen	316 m/sec
Air	331.5 m/sec
Ammonia	415 m/sec
Methane	430 m/sec
Helium	435 m/sec
Neon	965 m/sec

15) Speed Factor

15. SPEED FACTOR
FACTOR : 0.60m/°C

The sound speed in air increases or decreases at fixed rate (0.6m/ ℃). This option allows the rate of change in m/°C to be set according to the present atmosphere and temperature. This option is useful where ambiguous or mixed gas exists. The newly set value should be compared with the actual level, several times, to obtain an accurately displayed reading.

- Setting Range : -2.0m/℃ ~ 2.0m/℃

16) Material Temperature

16. MATERIAL TEMP
TEMP : 25.0°C

The XDS08/XDS12/XDS15 uses an integral temperature sensor, housed inside the transducer nose cone and therefore the compensation is the temperature close to sensor. In applications where there is a large difference between the temperature near the sensor and that at the surface of the material being measured, errors in measurement may occur. This mode allows for the present temperature at the material surface to be entered and reduces any error in measurement.

- Setting Range: 0~70.0°C

17) Material Temperature Weighting

17. MATERIAL T WEIGHTING
WET : 0%

This option is used in conjunction with **Mode 16, Material Temperature.** This option determines the effect the material temperature has on the air temperature in front of the transducer. Where the temperature of the material has no effect on the air temperature. **Mode** 17 should be set to **0,** in which case **Mode 16, Material Temperature** will be ignored. However in cases where the material temperature heavily influences the temperature at the transducer **Mode 17** should be set to **100** and temperature compensation will be performed accordingly.

- Setting Range : 0~100

18) Password Change

18. PASSWORD CHANGE
PASSWORD: 0

This option allows changing the password. The factory set is “0”. The available number is “0” to “999”.
If the password is forgotten, please request to the manufacturer.

19) Master Reset

19. MASTER RESET
RESET

This option makes all setting value into the factory setting value. If this option is applied, all setting values are reset. Before reset, pay attention to note the current setting values for reference.

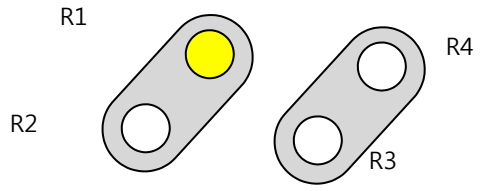
Select Reset with “mode” key, after showing “*” press “up” or “down” key. When [Run] shows, press “Run” key, all setting values are reset.

19. MASTER RESET
***RESET [RUN]**

Relay menu setting

This menu is about setting of the relay. Level Hunter II has 4 relays. Each relay operates independently. Each relay can be assigned a different order.

- The LED of the relay lights up when the relay operates.



COMMON MENU: [UP]

RELAY MENU:

==== RELAY MENU ====

01. ALT. RELAY SET

02. FIXED RELAY SET

03. RELAY TEST

01) RLY1(HH) Point Setting

01. RLY1(HH) ON POINT
ON : 8.00m

This option determines the high limit "ON" point for HH relay

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	7.00m
XDS 12	0 – 12.50m	11.00m
XDS 15	0 – 15.50m	14.00m

02) RLY1(HH) OFF Point Setting

02. RLY1(HH) OFF POINT
OFF : 4.00m

This option determines the high limit "OFF" point for HH relay

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	6.00m
XDS 12	0 – 12.50m	10.00m
XDS 15	0 – 15.50m	13.0m

03) RLY2(H) ON Point Setting

03. RLY2(H) ON POINT
ON : 8.00m

This option determines the “ON” point for H switched output

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	6.00m
XDS 12	0 – 12.50m	10.00m
XDS 15	0 – 15.50m	13.00m

04) RLY2(H) OFF Point Setting

04. RLY2(H) OFF POINT
OFF : 4.00m

This option determines the “OFF” point for H switched output

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	5.00m
XDS 12	0 – 12.50m	9.00m
XDS 15	0 – 15.50m	12.00m

05)RLY3(L) ON Point Setting

05. L ON POINT SET
ON : 8.00m

This option determines the “ON” point for L switched output

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	3.00m
XDS 12	0 – 12.50m	3.00m
XDS 15	0 – 15.50m	3.00m

06) RLY3(L) OFF Point Setting

06. RLY3(L) OFF POINT SET
OFF: 4.00m

This option determines the “ OFF” point for L switched output

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	4.00m
XDS 12	0 – 12.50m	4.00m
XDS 15	0 – 15.50m	4.00m

07) RLY4(LL) ON Point Setting

07. RLY4(LL) ON POINT
ON: 8.00m

This option determines the low limit “ON” point for LL relay

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	2.00m
XDS 12	0 – 12.50m	2.00m
XDS 15	0 – 15.50m	2.00m

08)RLY4(LL) OFF Point Setting

08. RLY(LL) OFF POINT SET
OFF : 4.00m

This option determines the low limit “OFF” point for LL relay

Transducer	Setting range	Factory set
XDS 08	0 – 8.50m	3.00m
XDS 12	0 – 12.50m	3.00m
XDS 15	0 – 15.50m	3.00m

From menu 09 to menu13 determines the relay on/off tentatively for the relay test.

09)RELAY1 TOGGLE

09. RLY1 TOGGLE
RLY1

10)RELAY2 TOGGLE

10. RLY2 TOGGLE
RLY2

11)RELAY3 TOGGLE

11. RLY3 TOGGLE
RLY3

12)RELAY4 TOGGLE

12. RLY4 TOGGLE
RLY4

13)ERROR RELAY TOGGLE

13. ERROR RELAY TOGGLE
ERR RLY

Important Information

The value of **HH relay ON point** should be higher than **OFF point** and this function is recommended for high limit.
The value of **LL relay ON point** should be lower than **OFF point** and this function is recommended for low limit
H, L relay are recommended for **pump control, draining control, high and low liquid level warning, etc.** at user's need.

Chapter 5 Digital Communication

The LEVEL HUNTER II Series provides RS232/485 digital communication interface function as option

The kinds of data and its format are as follows;

Output Data

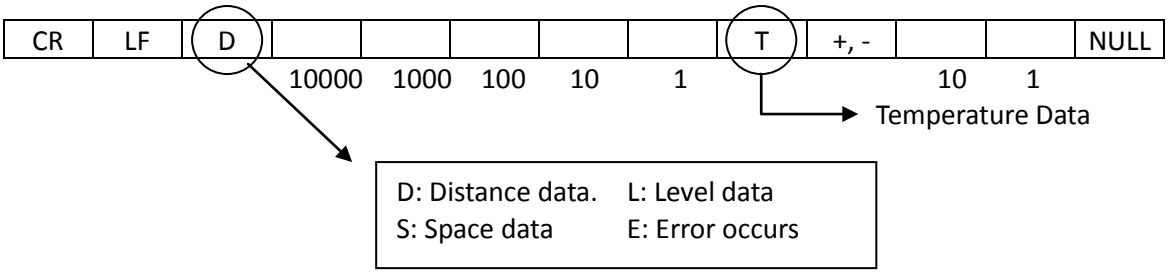
1. Kinds of Output Data

1) Distance Data
   - Distance from the sensor to the surface of measuring material. Unit is mm.

2) Temperature Data
   - This is temperature data measured by the built-in temperature sensor. Unit is 1°C.

2. Data Format

Data is edited by ASCII and the sequence as follows



A. Baud Rate is 4800bps

B. 1 Data Frame consists of Total 13 byte

C. Data Frame outputs per second

D. The number located at 10000 means 10000mm digit number

E. +/- means above/below zero in temperature. The number located at 10 means 10 degree digit number in °C/°F

Chapter 6 Trouble shooting

This section describes some problem symptoms, with suggestions as to what to do.

Symptom	What to Do
Display blank, transducer not firing.	Check power supply
Display shows “S”, “ ERROR! LOST ECHO”	“S” means there is an abrupt liquid change or an obstacle in the beam path is detected. Check the obstacle and remove it. Also, locate the transducer away from false echoes like walls, floats, or ladders.
Display shows “ BOTTOM SET ERROR”.	Measuring range is larger than parameter value of maximum bottom range. Go to 03, and set the correct larger bottom distance.
LE blink	Confirm the sensor installation is in a suitable place away from any obstacles like walls, floats or ladders within the beam path. Find the obstacle and remove of it or locate the transducer away from these obstacles. Transducer should be 1 ft from wall for every 8 ft vertical.

Call ECHO Technical Support: 850-609-1300

Menu Option Record

LEVEL HUNTER II Series

When menu 19 “Master Reset” is used, refer to the record card below:

Option Details		Entered Value					
Common Menu							
No.	**Description**	**Factory Set**	**Factory Set**	1	2	3	4
00	SENSOR TYPE	8M / 12M / 15M	8M				
01	MEASURE TYPE	LEVEL / DISTANCE / SPACE	LEVEL				
02	BOTTOM DISTANCE	0.00~8.5(12.5 / 15.5)	8.00 m				
03	DEAD BAND	0.00~8.2(12.0 / 15.0)	0.35 m				
04	4mA POINT	0.00~8.5(12.5 / 15.5)	0.00 m				
05	20mA POINT	0.00~8.5(12.5 / 15.5)	7.50 m				
06	TRANSMIT POWER	1 ~ 5 (weak / strong)	3 (Normal)				
07	DETECT THRESHOLD	4 ~ 15	6 (0.6V)				
08	DAMPING RATE	0.01 ~ 100 m/min	1.0 m/min				
09	ERROR CURRENT SET	3.8mA / Hold / 21.0mA	3.8 mA				
10	FAIL SAFE TIME	20 ~ 999	300 sec				
11	mA OUTPUT TEST	HOLD / 3.8 / 4 / 12 / 20 / 21mA	HOLD				
12	DISTANCE UNIT	m (METER) / ft (FEET)	m (METER)				
13	DETECT ALGORITHM	FIRST ECHO / MAX ECHO	FIRST ECHO				
14	SOUND SPEED	0 ~ 999	331.5 m/s				
15	SPEED FACTOR	0 ~ 999	0.60m/℃				
16	MATERIAL TEMP	0 ~ 999	25.0℃				
17	MATERIAL T. WEIGHT	0 ~ 100%	0%				
18	PASSWORD CHANGE	0 ~ 999	0				
19	MASTER RESET	-	-				
Relay Menu							
01	RLY1(HH) ON POINT	0.00~8.5(12.5 / 15.5)	7.00 m				
02	RLY1(HH) OFF POINT	0.00~8.5(12.5 / 15.5)	6.00 m				
03	RLY2(H) ON POINT	0.00~8.5(12.5 / 15.5)	6.00 m				
04	RLY2(H) OFF POINT	0.00~8.5(12.5 / 15.5)	5.00 m				
05	RLY3(L) ON POINT	0.00~8.5(12.5 / 15.5)	2.00 m				
06	RLY3(L) OFF POINT	0.00~8.5(12.5 / 15.5)	3.00 m				
07	RLY4(LL) ON POINT	0.00~8.5(12.5 / 15.5)	1.00 m				
08	RLY4(LL) OFF POINT	0.00~8.5(12.5 / 15.5)	2.00 m				
09	RLY1 TOGGLE	RELAY1 ON/OFF	-				
10	RLY2 TOGGLE	RELAY2 ON/OFF	-				
11	RLY3 TOGGLE	RELAY3 ON/OFF	-				
12	RLY4 TOGGLE	RELAY4 ON/OFF	-				
13	ERROR RLY TOGGLE	ERR RELAY ON/OFF	-				