

# OPERATING MANUAL

## Dataloggers 3660/3634



**AANDERAA INSTRUMENTS**  
DATA COLLECTING INSTRUMENTS FOR LAND SEA AND AIR

TABLE OF CONTENTS

	TABLE OF CONTENTS .....	0-01
CHAPTER 1.	INTRODUCTION	
	Short Description .....	1-01
	Examples of Applications .....	1-03
	Specifications .....	1-04
CHAPTER 2.	PROGRAMMING	
	<b>Programming by Control Switches</b> .....	2-01
	Display Last Data Set .....	2-02
	Buzzer Setting .....	2-02
	Channel settings .....	2-02
	Set Owners Name / Location .....	2-03
	Set Date and Time .....	2-04
	Display Raw Data .....	2-04
	View Number of Calls .....	2-04
	Set Number of Channels .....	2-04
	Set Recording Interval .....	2-04
	Memory Setting .....	2-05
	Channels Sent to Voice .....	2-05
	Clear All Data .....	2-05
	Clear All Parameters .....	2-06
	Last Reading Port Setup .....	2-06
	Set Baud rate .....	2-06
	Set Alarm Number .....	2-06
	Set Alarm Interval .....	2-07
	Modem Initialization .....	2-07
	Serial Settings .....	2-08
	.....	
CHAPTER 3.	SERIAL COMMUNICATION	
	<b>Communicating with Datalogger using Hyper Terminal</b> .....	3-01
	Setup Menu .....	3-02
	11. Last Data .....	3-02
	12. Channel Settings .....	3-03
	13. Channel List .....	3-03
	14. Display Raw Data .....	3-03
	15. Number of Channels .....	3-04
	16. Recording Interval .....	3-04
	17. Show Elapsed Sequence (Current program) .....	3-05
	18. Remote Start Trigger .....	3-05
	21. Set Location and Owners name .....	3-05
	22. Set Date and Time .....	3-05
	23. Set New Password .....	3-06
	24. View Number of Calls .....	3-06
	25. Command Mode .....	3-06
	99. Quit/Hang-up .....	3-06
	31. Modem Initialization String .....	3-06
	32. Set Baud Rate .....	3-07
	33. Last Reading Port Setup .....	3-07
	34. Serial Setting .....	3-08
	41. Memory Setting .....	3-08
	42. Sent to Voice .....	3-08

43. Clear All Data	3-08
44. Clear All Parameters	3-08
51 Set Alarm Number	3-09
52. Set Alarm Interval	3-09
CHAPTER 4. MODEM COMMUNICATION	
Enter Setup Menu	4-02
Retrieve data from memory using Hyper Terminal	4-02
Retrieve data from a specific time period within the Datalogger's Memory	4-03
CHAPTER 5. MISCELLANEOUS AND TROUBLE SHOOTING	
Calculation of Engineering Units	5-01
Combine two 10-bit Channels into one 20-bit Channel	5-01
Present dew Point as a Virtual Channel	5-01
Set the Datalogger to operate with Display Program 3710	5-02
Set the Datalogger to operate with Voice Generator 3420	5-02
Reset of the Datalogger	5-02
Default Setting	5-03
Trouble Shooting Chart	5-04

## CHAPTER ONE

INTRODUCTION**Short Description**

The Dataloggers 3660 and 3634 are low power, lightweight and watertight field operating devices displaying data in engineering units. They are designed for battery operation and can operate with all Aanderaa standardized sensors. The 3660 and 3634 units scans up to 17 or 4 sensors respectively making them well suited for a variety of field data-logging applications such as Automatic Weather Stations, Road Weather Stations, Wind Monitoring Systems and Water Level Measuring Systems.

Data can be transmitted as raw-data in 10-bit code by VHF or UHF-radio, or as engineering units by modem. Data can also be presented as a voice message by connecting Voice Generator 3420. If connected directly to a PC, or via modem, the Display Program 3710 can be used for real-time data display. When the unit is connected to a modem, alarm limits can be set for each sensor connected. When an alarm is triggered the unit can dial a preset telephone number and send an alarm message to another modem or to a pager.

The electronic circuit-board is molded in Scotchcast, housed in an 28x178x271mm anodized aluminum cover, designed for wall mounting. It is furnished with a 4-line 40 character LCD, two control switches and a set of watertight receptacles for electrical connection. If power is lost the unit will retain its programmed information and data due to an internal back-up battery.

A built-in quartz clock generates the trigger pulse for the unit. Selectable recording intervals are : 0.5, 1, 2, 5, 10, 20, 30, 60, 120 and 180 minutes.

The unit also has a non-stop mode and a remote-start mode. In the latter case a single measurement cycle is performed on reception of a remote triggering signal.

When triggered by the clock or by a remote-start

signal, the unit scans up to 18 channels in sequence. Channel 1 is a built-in reference channel, while the other is for connecting sensors. The analog to digital converter converts the sensor readings into raw data in 10-bit binary code which is fed to the PDC-4 output.

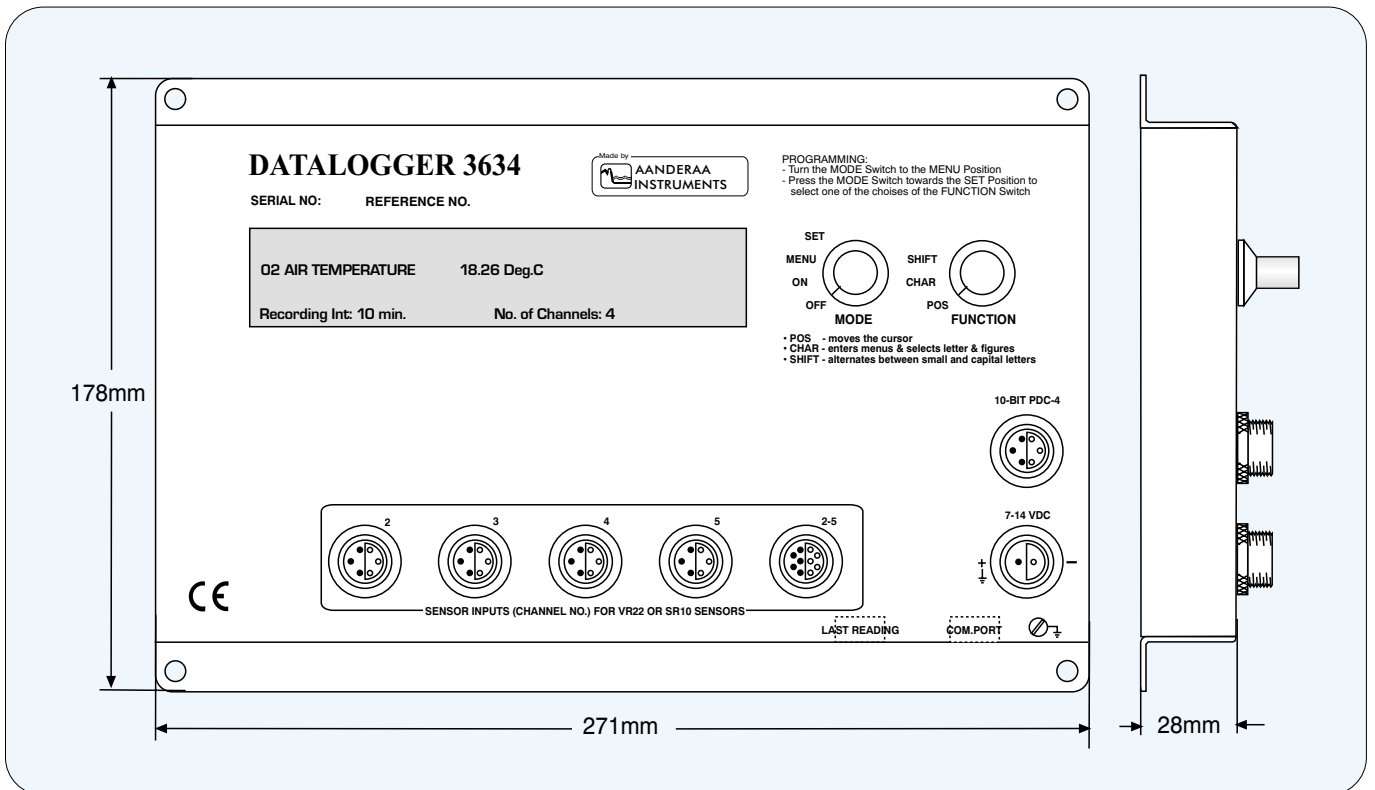
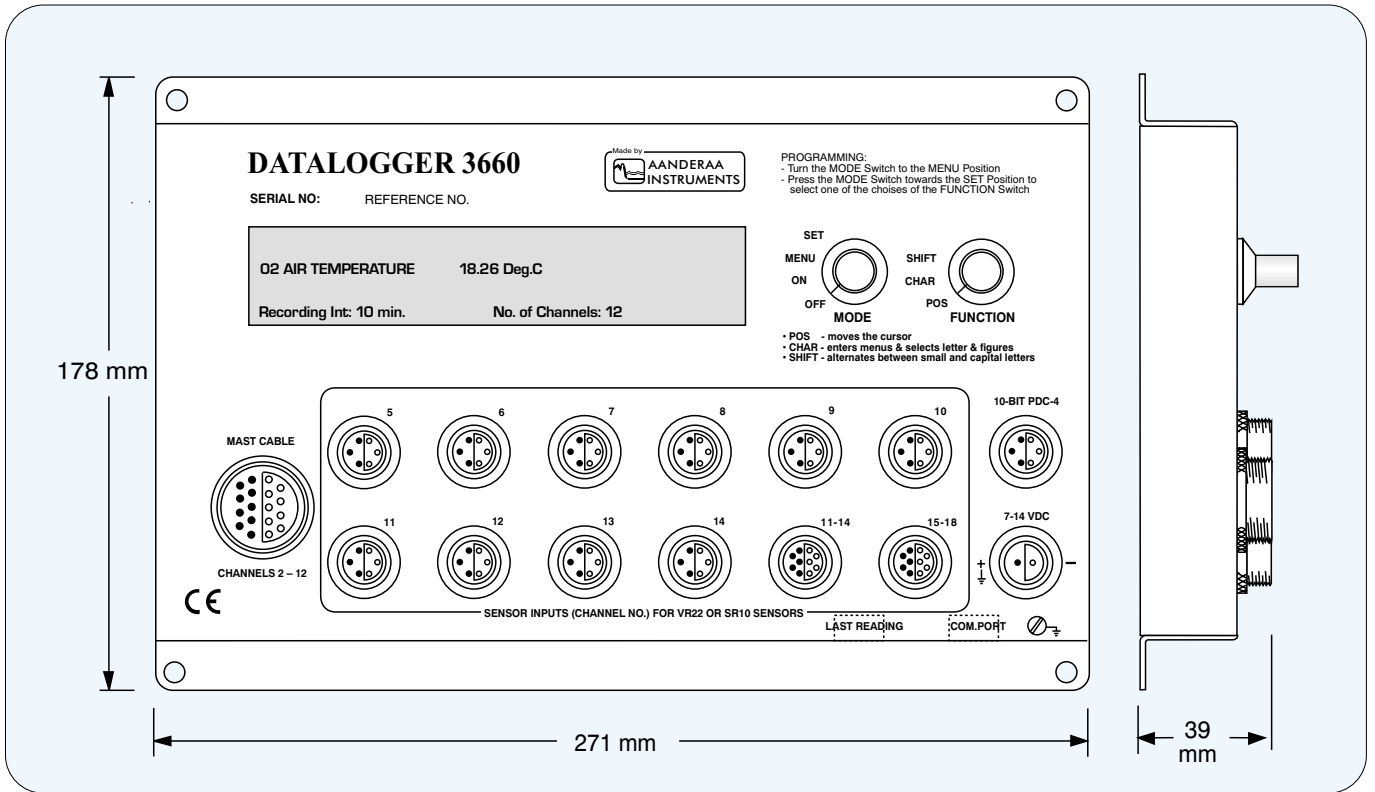
When operating the readings are displayed successively in engineering units on an LCD and at the same time stored in the units internal memory. After measuring the last channel, the display will go blank until the unit is triggered again. The stored data can be accessed directly from a personal computer or over the telephone network by connecting the unit to a modem.

The Last Reading output will send an ASCII string after each channel has been measured, containing the channel number, parameter name, reading and unit for each channel (see page 6).

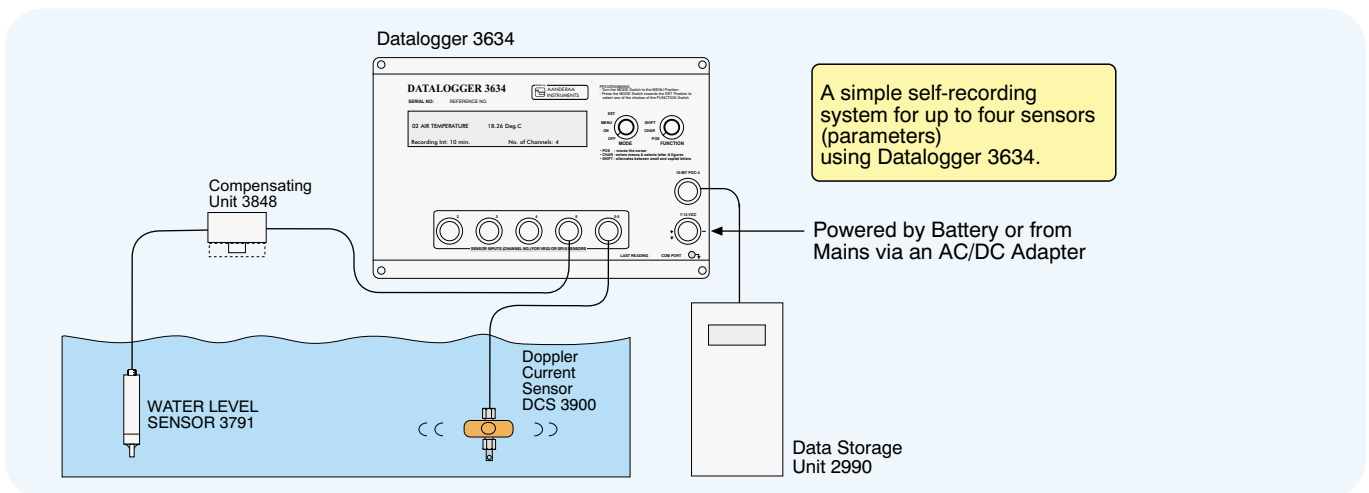
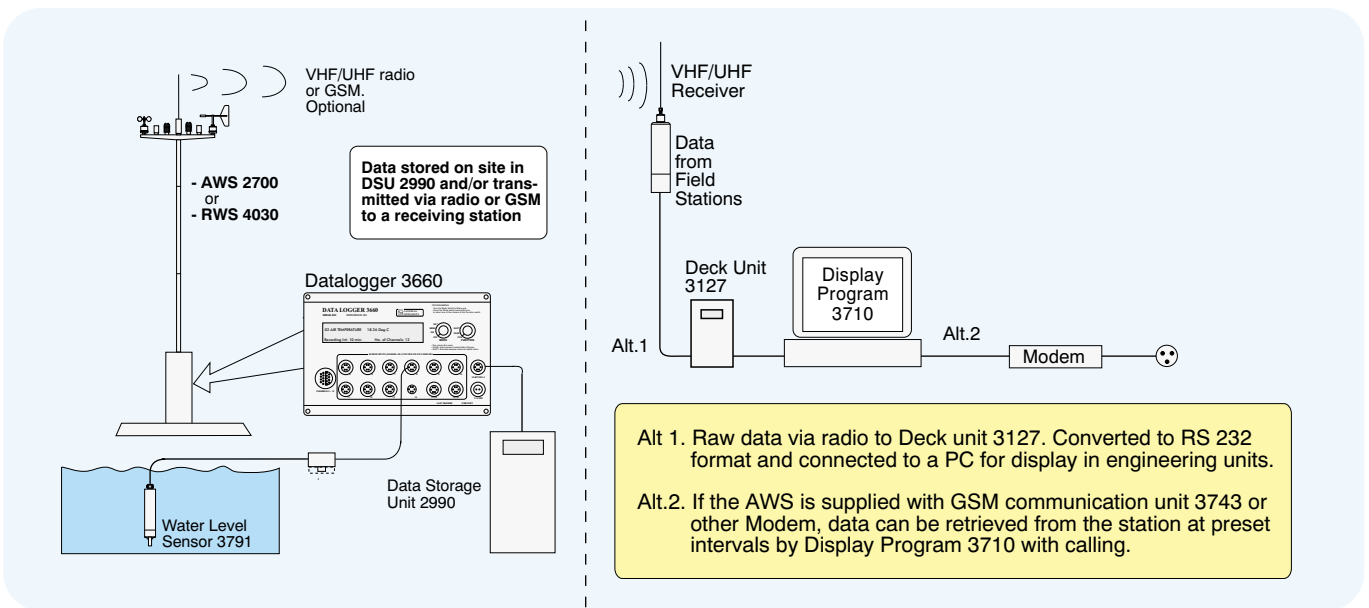
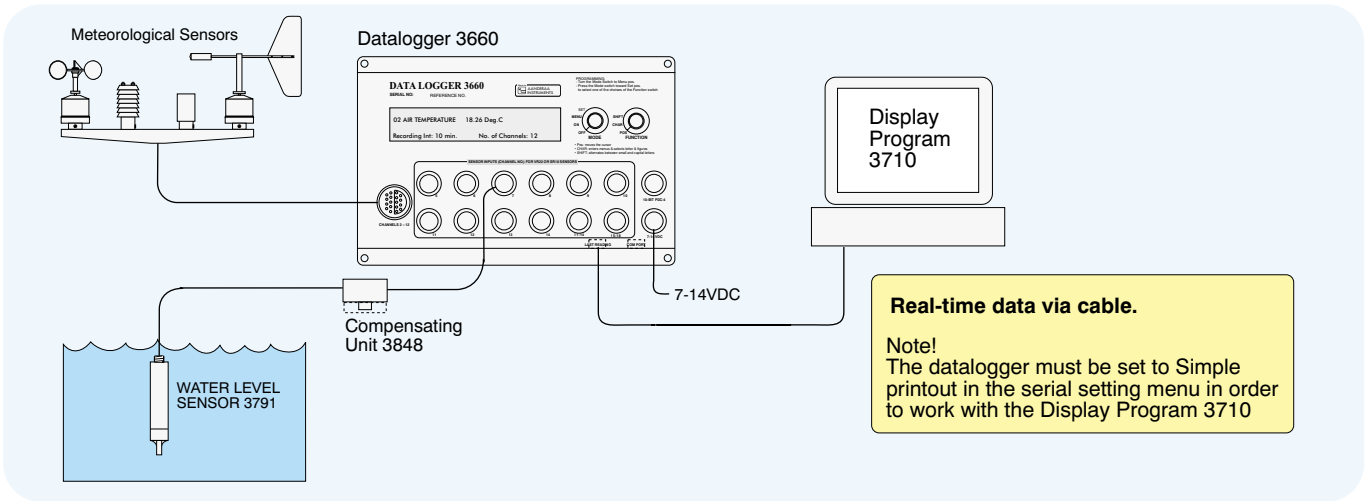
Although the dataloggers are either 5 or 18 channel loggers the first channel is always allocated a reference reading which is a number between 0 and 1023. This is a fixed reading in the beginning of every measuring cycle and it serves as a station identification number as well as a performance test. If a special number is needed as reference value, coefficients can be entered for this channel as for the other channels. The other channels are available for sensors.

**Safety back-up** of raw data, in addition to the internal stored data in engineering units, is recommended using an external data storage unit DSU 2990,2990E or 2990F. The 2990 version can store up to 65000 data words, the 2990E version up to 262000 data words and these versions will, when full, block for further data storage. The 2990F version, however, will continue to store data but then overwrite the oldest ones. The same storage units are also used for **long-term data storage** exceeding the internal storage capacity.

Storage Capacity, days The figures are estimated values and must be considered as a guideline.																	
Interval minutes	Number of Channels																
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0,5	5	4	4	3	3	3	—	—	—	—	—	—	—	—	—	—	—
1	10	9	8	6	6	5	5	4	4	4	4	3	3	—	—	—	—
2	19	17	15	12	11	10	10	9	8	8	7	6	6	6	6	5	5
5	48	42	38	31	28	26	24	21	20	19	18	16	15	15	14	13	13
10	96	84	75	62	56	52	48	42	40	38	36	32	31	30	28	26	25
20	190	167	149	122	112	104	96	84	80	75	71	64	62	59	56	52	50
30	282	248	221	182	167	155	144	126	119	112	106	96	92	88	84	78	75
60	543	480	430	355	327	303	282	248	234	221	210	190	182	174	167	155	149
120	1003	896	809	677	626	582	543	480	454	430	408	372	355	341	327	303	292
180	1379	1248	1138	965	896	836	784	696	659	626	596	543	520	499	480	445	430



EXAMPLES OF APPLICATIONS



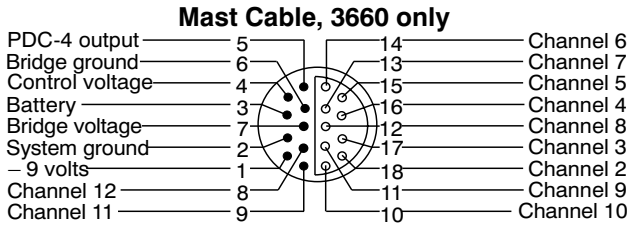
SPECIFICATIONS FOR DATALOGGER 3660 AND 3634

SPECIFICATIONS FOR DATALOGGER 3660/3634

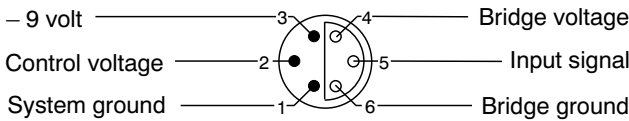
AANDERAA INSTRUMENTS

**PIN CONFIGURATION**

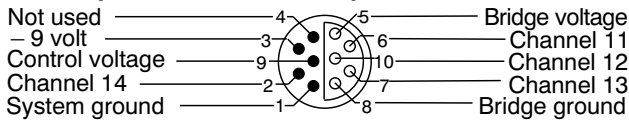
Receptacle, exterior view; pin = ●; bushing = ○



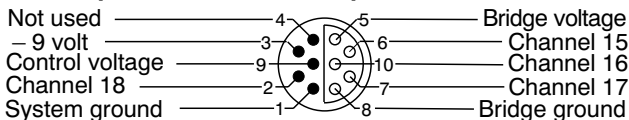
**Single Parameter Sensor Input, both units**



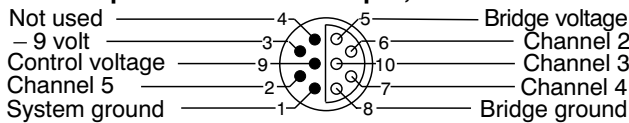
**Multiparameter Sensor Input, 3660: Ch 11-14**



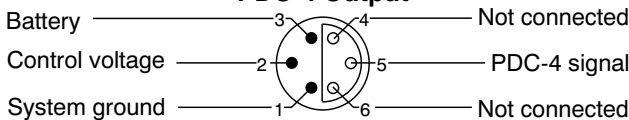
**Multiparameter Sensor Input, 3660: Ch 15-18**



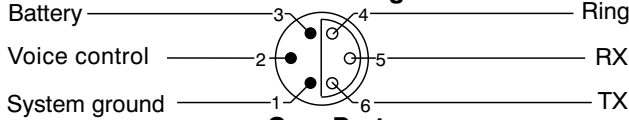
**Multiparameter Sensor Input, 3634: Ch 2-5**



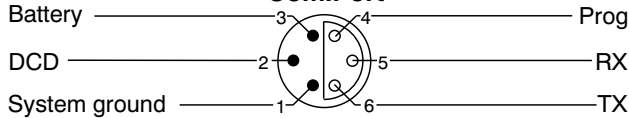
**PDC-4 Output**



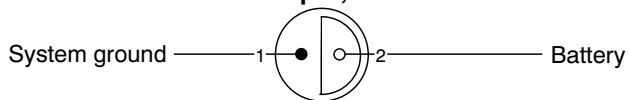
**Last reading**



**Com.Port**



**Power Input, 7-14VDC**



**Input signal, 3660:** Up to 17 VR22 or SR10 sensors  
**3634:** Up to 4 VR22 or SR10 sensors

**Recording intervals:** 0.5, 1, 2, 5, 10, 20, 30, 60, 120, 180 minutes. In addition: nonstop and remote start. 4 seconds each channel

**Remote Start:** 5V positive pulse to pin 5 of the PDC-4 output receptacle

**Resolution:** 10 bit binary

**Accuracy:** ±1bit binary

**Battery indication:** Range: 6-15 V

**Output signals:** 10 bit PDC-4

**Aanderaa code:** ASCII coded selectable from 1200 to 9600 baud, 8 data bit, 1 stop bit, no parity, no handshake. RS-232C string, See below

**LAST READING and COM PORT:**

**Internal storage:** RAM. ( See table page 2)

**Power Supply:** 7-14 volt DC

**Current consumption:** Quiescent: 50µA, 15mA average when operating

**Operating temp.:** -40 to +60°C  
 LCD:-15 to +60°C

**Material and finish:** Scotchcast molding with hard anodized aluminum case, 10-15µ

**Weight:** 1.9kg

**Warranty:** Two years against faulty materials and workmanship

**Accessories included:** Data/Programming Cable 3204  
 optional: AC/DC Adapter 3786

**Approvals:** CE certified

Ready made cables are available for connecting the Dataloggers to:

DSU 2990 .....	Cable 2842
Voice Generator 3420 .....	Cable 3296
PC/CRT .....	Cable 3204
Field Modem 3431 .....	Cable 2842
Printer (Epson) .....	Cable 3206
Printer (Seiko) .....	Cable 3279
External Modem, 25 pins .....	Cable 3205

RS-232C String, Available on Last Reading receptacle:

01 Reference 834.00  
 02 Water level 3.43 m

Protocol:

CHANNEL NO.: 2 CHAR.<SPACE>. PARAMETER NAME: 19 CHAR. <SPACE>

READING: 5 CHAR. <POINT> DECIMALS: 2 CHAR.<SPACE> UNIT: 5 CHAR.<LF>& <CR> WITH AN EXTRA <LF>& <CR>

AFTER THE LAST CHANNEL.

Printout of time and battery voltage is optional

## CHAPTER TWO

PROGRAMMING

To convert raw data into engineering units, the parameter names, units and calibration coefficients must be entered into the datalogger. The coefficients for the individual sensors are given in the calibration sheet following each sensor. Programming is normally done at the factory prior to delivery but can also be done by the user following the instructions in this manual.

Programming can be done by:

Using the two control switches in front of the panel, see chapter two, page 2-01.

Using a computer, see chapter three, page 3-01.

Using a modem, see chapter four, page 4-01.

LCD MENUS**Programming by Control Switches**

To enter the programming mode, turn the Mode Switch to the MENU position. A menu will appear on the LCD.

<b>Main</b>	[Prev]	<u>          Main Menu          </u>	
<b>Menu</b>	[Enter]	>Display Last Data Set	<
	[Next]	Buzzer Setting	
		Channel Settings	

The text in square brackets on the LCD is an operating key or field. The field **[Prev]** and **[Next]** is for scrolling through all menu items. The **[Enter]** field is for entering the menu item inside the “> <” brackets.

- To move the cursor to another field, set the Function Switch in the POS position and then press the Mode Switch towards the SET position.
- To enter a field or a menu item, or to select letters and figures, set the Function Switch to the CHAR position and press the Mode Switch towards the SET position.
- To alter between capital and small letters set the Function Switch in the SHIFT position and then press the Mode Switch towards the SET position.

To simplify programming the “repeat” function will be activated if the Mode Switch is held in the SET position.

### Display Last Data Set.

To cycle through all active channels and view the last sensor readings, move the cursor and activate the [Next Ch.] field. The external “Battery Voltage”, active “Recording Interval” and “Elapsed Time since Last Record” is displayed at the bottom of the LCD.

```
>Display Last Data Set < [Exit]
                        [Next Ch.]
01 Reference           186
Batt:12.3V Int.: 2.0 min. Last: 0:01:35
```

### Buzzer Setting

To toggle the status of the buzzer, move the cursor and activate the [On/Off] field. At the bottom of the LCD, the status of the buzzer is displayed. If buzzer is “On” a sound signal will be heard when the Datalogger is scanning sensors.

```
>Buzzer Setting      < [Exit]
                    [On/Off]

Buzzer is OFF
```

### Channel Settings

This menu is for entering, sensor parameter names, sensor unit names, A, B, C and D calibration coefficients. All these parameters are given in the calibration sheet following each sensor. In addition this menu is also for entering alarm high limits, alarm low limits and number of decimals each sensor reading is to be displayed and stored with. The different parameters for each sensor are selected by moving the cursor and activate the [Next in Ch.] field. The active parameter type is shown on line 3 of the LCD, next to the channel number.

```
>Channel Settings   < [Exit]
                    [Next Ch.]
Channel...00:<Par.Name> [Next in Ch.]
[Battery Voltage ] [Pres.Names]
```

CHANNEL ...XX: <PAR.NAME> - PARAMETER NAME

This parameter is for setting parameter name for the sensor, e.g. “**Wind Speed**”. The selected channel number is displayed on line 3 of the LCD. A template of parameter names can be cycled through by moving the cursor and activate the [Pres. Names] field. When a parameter name is selected from the template list, a unit name is also selected. These units are the most common units used by sensors delivered from Aanderaa Instruments. If none of these parameter names or unit names can be used, enter the parameter name manually. This is done by moving the cursor to the editable field (below the text “Channel...xx”). Enter the field by setting the “Function Switch” in the “CHAR” position and flipping the “Mode Switch” to the “SET” position. The cursor will change to an “underline” cursor in the first position of the editable field.

Characters can now be selected by flipping the “Mode Switch” to the “SET” position while the “Function Switch” is in the “CHAR” position. Turning the “Function Switch to the “SHIFT” position will toggle between small and capital letters. Move the cursor to set the next character by setting the “Function Switch in the “POS” position and flip the “Mode Switch” to the “SET” position.

To simplify programming a “repeat” function will be activated by holding the “Mode Switch” in the “SET” position. To exit from editing the text, move cursor through the whole editable field. The cursor will change to a square blinking cursor again.

Channel ...xx: - Unit Name

This parameter is for setting the unit name for the sensor, e.g. “**Deg.C**”( Degrees Celsius). The selected channel number is displayed on line 3 of the LCD. A template of unit names can be cycled through by moving the cursor and activate the [**Pres. Units**] field. When unit names manually, follow the same procedure as for Parameter Name (see above).

Channel ...xx:<Coeff. A>, <Coeff. B>, <Coeff. C>, <Coeff. D> - Calibration Coefficient A, B, C, D

To enter a calibration coefficient, move the cursor to the editable field [**+0.000E+00**] and enter it by setting the “Function Switch” in “CHAR” position and flip the “Mode Switch” to “SET” position. The cursor will change from a blinking square cursor to an “underline” cursor. The character “+” can be changed to “-” and the numbers can be set in the range 0 to 9 by setting the “Function Switch” in the “CHAR” position and flipping the “Mode Switch” to the “SET” position.

CHANNEL ...00: <ALARM HI>, <ALARM LO> - ALARM HI AND ALARM LO

To enable the alarm, move the cursor and activate the [**Enable**] field. The display will change and two new keys will appear.

**[+0.000E+00]:**

This editable field is for entering the alarm limits. For example if an alarm is to go off when the temperature goes above 30 Deg.C and drops below 5 Deg.C. Set the Alarm HI to [**+3.000E+01**] and Alarm LO to [**+5.000E+00**].

**[Rep.]ON:**

An alarm message will be sent when the alarm high or alarm low limits are exceeded. The alarm message will be repeated by the time specified in the “Set Alarm Interval” menu. It will continue repeating as long as the alarm high or alarm low limits are exceeded.

**[Rep.]OFF:**

When the alarm high or alarm low limits are exceeded, an alarm message will be sent. The message will not be repeated. After setting the alarm limits and the alarm repetition property, go to the “Set Alarm Number” menu. Select alarm type and set alarm number if pager or modem is set as alarm type. Then go to the “Set Alarm Interval” menu to set the alarm repetition time.

Channel ...xx:<Num.Dec.> - Number of decimals

This parameter is for selecting number of decimals each sensor reading is to be displayed and stored with. Channel 0, Battery Voltage has a fixed decimal setting of 1 and can not be altered. If another channel is selected, [**Num. Dec.**] is displayed. Activating this field will enable the user to toggle between, 0, 1 or 2 decimals. This setting will affect all outputs showing engineering units.

**Set Owners Name/Loc.**

This menu has two editable fields, **Name:** [ ] and **Loc.:** [ ]. To enter one of the fields move the cursor to the **Name** or **Loc** and enter the field by setting the “Function Switch” in the “CHAR” position and flipping the “Mode Switch” to the “SET” position. The cursor will change to an “underline” cursor in the first position of the editable field. To select characters see page 2-02.

```
>Set Owner's Name/Loc. < [Exit]
Name: [Owner's Name] ]
Loc.: [Location] ]
```

Channel ...xx: <Par.Name> - Parameter Name menu.

### Set Date and Time

At the lower end of the LCD the current date and time is shown. The first part of the time is in brackets like "> <". This is the "In Date" cursor. To move this cursor, activate the **[NextInDate]** field. If the value within the "InDate" cursor is to be edited, activate the **[Increase]** field, or the **[Decrease]** field.

```
>Set Date and Time      <  [Exit]
                        [NxtInDate]
                        [Increase]
_____
>12<   March-2001  8:41:33  [Decrease]
```

### Display Raw Data

Raw data in Aanderaa terms is a 10-bit number ranging from 0 to 1023. The current setting is displayed at the bottom of the LCD. This setting applies to data presented on the LCD, listing of historical data from the "Com. Port" and the data presented on the "Last Reading" port. To toggle the status, move the cursor and activate the **[Yes/No]** field.

```
>Display Raw Data      <  [Exit]
                        [Yes/No]

Displaying raw data: NO
```

### View Number of Calls

Enter this menu to view the number of telephone calls made to the Datalogger.

```
>View Number of Calls  <  [Exit]

Number of Calls:
Modem:9      Voice:0      Total:9
```

### Set Number of Channels

The current number of active channels is shown at the bottom of the LCD. To change the number of active channels, move the cursor and activate either the **[Increase]** field or the **[Decrease]** field. If the text "Recording Interval Limit" is shown, it means that the number of channels is too high for the current recording interval. The recording interval has to be increased. Enter the "Set Recording Interval" menu.

```
>Number Of Channels    <  [Exit]
                        [Increase]
Number of              [Decrease]
Channels..03 (Max:18)
```

### Set Recording Interval

The current recording interval is displayed at the middle of the LCD. Moving the cursor and activating the **[Next Int.]** field will cycle through a list of preset intervals. The intervals are:

```
>Set Recording Interval < [Exit]
                        [Next Int.]
Interval:   2 min.
Estimated memory full: 24 March 01
```

Remote Start, Nonstop, 0.5, 1, 2, 5, 10, 20, 30, 60, 120, and 180 minutes. The bottom line of the LCD will indicate an estimated date when the internal memory is full. If "Remote start" is selected estimation is not applicable.

### Remote Start mode:

No scheduled readings, only a +5 volt "Remote start pulse", at the 10-bit PDC-4 signal pin, will start a reading cycle. A "Remote start pulse" will also start a reading cycle while in normal "time scheduled mode", but only if there is enough time to complete a recording cycle before the scheduled time.

Nonstop mode:

The Datalogger reads the sensors consecutively without any intermission between recordings

**Memory Settings**

In this menu there are three settings. Moving the cursor and activating the **[Skip/Overwr.]** field, or the **[Store/Not]** field will toggle the settings.

```
>Memory Setting          <  [Exit]
Memory when full:Overwr. [Skip/Overwr]
Battery Voltage :Skipped  [Store/Not]
Reference ch.      :Stored [Store/Not]
```

Memory when full:

**Skipping** – When memory is full, the Datalogger stops recording new records.

**Overwr.** – When memory is full, the Datalogger overwrites the oldest record with a new.

Battery Voltage:

**Stored** – The Datalogger has a built-in circuit measuring the external battery voltage. This setting will add the Battery Voltage to every record stored in the Datalogger’s internal memory.

**Skipped** – This setting will prevent the battery voltage measurement from being stored in the Datalogger’s internal memory.

Reference ch.:

**Stored** – This setting will add the reference reading to every record, stored in the Datalogger’s internal memory.

**Skipped** – This setting will prevent the reference reading from being stored in the Datalogger’s internal memory.

**Channels Sent to Voice**

In this menu there are three keys: **[Exit]**, **[Next Ch.]** and **[Sent/Not]**. To prevent a faulty sensor reading to be relayed to the Voice Generator 3420, move the cursor and activate the **[Next Ch.]** field until the desired channel is displayed. Move the cursor and activate the **[Sent/Not]** field to toggle the status of the channel. The status is displayed at the bottom of the LCD.

```
>Channels Sent to Voice <  [Exit]
                             [Next Ch.]
00: Battery Voltage         [Sent/Not]
is not sent to voice
```

channel is displayed. Move the cursor and activate the **[Sent/Not]** field to toggle the status of the channel. The status is displayed at the bottom of the LCD.

**Clear All Data**

To clear all data recorded in the Datalogger’s internal memory, move the cursor and activate the **[DELETE]** field. Set the “Function Switch” in the “SHIFT” position and flip the “Mode Switch” to the “SET” position. If data are successfully deleted the bottom line of the LCD will display: “Deleted!”

```
>Clear All Data          <  [Exit]
                             [DELETE]
Use SHIFT on DELETE button
```

“SET” position. If data are successfully deleted the bottom line of the LCD will display: “Deleted!”

### Clear All Parameters

To clear all parameter names, unit names, etc. in the Datalogger's internal memory, move the cursor and activate the **[DELETE]** field. Set the "Function Switch" in the "SHIFT" position and flip the "Mode Switch" to the "SET" position. If the parameters are successfully deleted the bottom line of the LCD will display: "All Parameters Deleted!"

```
>Clear All Parameters      [Exit]
                           [DELETE]

Use SHIFT on DELETE button
```

### Last Reading Port Setup

This menu is for selecting the RS-232C output format of the "Last Reading" port. By moving the cursor and activate the **[PC/Voice]** field, the user can toggle between PC and Voice. The status of the port is shown at the bottom of the LCD.

```
>Last Reading Port Setup  [Exit]
                           [PC/Voice]

The Last Reading port is set to: PC
```

#### PC:

Is selected when the "Last Reading" port is connected to an external equipment's serial port.

#### Voice:

Is selected when the "Last Reading" port is connected to an Aanderaa Voice Generator 3420. Data will only be transmitted from the "Last Reading" port when the Datalogger receives a "ring" signal on the "ring" pin of the "Last Reading" port.

### Set Baud Rate

This menu is for setting the baud rate of the "Last Reading" port and the "Com-Port". The selected baud rate is valid for both ports. Move the cursor and activate the **[Next Speed]** field to set a new baud rate. Available baud rates: 1200, 2400, 4800 and 9600.

```
>Set Baud Rate            [Exit]
                           [Next Speed]

Current Baud Rate : 2400
Selected Baud Rate: 2400
```

### Set Alarm Number

This menu is for selecting alarm type and setting the alarm telephone number. In order for the alarms to operate they have to be ENABLED and alarm limits has to be set. This is done in the "Channel Settings" menu. See page 2-02. There are three types of alarm modes: PAGER, MODEM and LINE.

```
>Set Alarm Number        [Exit]
                           [Next Type]

Alarm is sent to MODEM at
[           ]
```

#### Pager:

Usually some extra "AT" commands needs to be added to the modem initialization string to get this mode to operate correctly. However this will depend on the pager system in various countries and the modem connected to the Datalogger. When an alarm is triggered the Datalogger will make the modem dial the alarm number. After the alarm number is dialed, there has to be a pause before the pager system is ready to receive the alarm code. The "S8" register in the modem specifies the pause time. In the example below an extra command, "ATS8=10" is added to the modem initialization string: This will give a pause time of 10 seconds pr. comma in the alarm number.

**Example:**

Alarm number entered by user: "0W99228844,,,"  
 Dial prefix "0" to get access to an outside line  
 Wait for new dial tone  
 Telephone number to pager system  
 Three commas indicating a pause time of 30 seconds

Alarm code example: 0343121  
 Datalogger's reference reading  
 Channel number  
 Alarm high (0 = alarm low)

**Modem:**

This mode will need an alarm number. When connection is established between the modem connected to the Datalogger and the modem receiving the alarm, an alarm string is transmitted.

Example: "Location , Water Level : Alarm HI"

**Line:**

With the alarm type set to LINE, an alarm number is not required. When an alarm is triggered, the alarm string, as for MODEM, is sent to the "Com Port".

**Set Alarm Interval**

In order for the alarm repetition interval to operate, the alarms have to be ENABLED and repetition has to be set ON. This is done in the "Channel Settings" menu. See page 2-02. Three keys are displayed in this menu: [Exit], [+1 minute] and [-1 minute]. Adjust the alarm repetition interval by moving the cursor and activating either the [+1 minute] field or the [-1 minute] field. The alarm will be sent when the alarm high or alarm low values are exceeded. If repetition property is set ON, the alarm will be repeated with the time specified in this menu. It will continue repeating as long as the alarm high or alarm low values are exceeded.

```
>Set Alarm Interval      [Exit]
                        [+1 minute]
Alarm repetition interval [-1 minute]
Is set to: 10min.
```

Minimum repetition interval is 10 minutes and maximum interval is 99 minutes. The current interval is displayed at the bottom of the LCD.

**Modem Init**

In this menu initialization commands to a modem can be set. The Datalogger contains a set of default initialization commands. The default commands will operate with the most common modem types. To set the Datalogger to default commands, move the cursor and activate the [Default] field. If transmission problems occur when trying to retrieve data from the Datalogger, replace or add new "AT" commands to the initialization

```
>Modem Init             [Exit]
                        [NextCommand]
                        [Default]
Command 00: [AT&F      ]
```

string. Referring to the modem manual check if the following default "AT" commands has the same meaning as listed below.

**Default Modem Init String:**

- AT&F – Restore factory configuration
- AT&Q0 – Direct mode
- AT&K0 – Disable flow control

- AT&D0 – Ignore DTR signal
- ATE0 – Local Echo off
- AT&W – Store active profile

A total of 10 commands can be set. All commands must begin with capital “AT” to be accepted. The default command list has a command named “MVSET”, (ModemVoiceSET). This command has to be set in all cases. It is a substitute for the commands ATSO=1 (autoanswer) and ATSO=5 (autoanswer after 5 rings). If the “Last Reading” port is set to PC, then the ATSO=1 command is sent. If the “Last Reading” port is set to Voice, the ATSO=5 command is sent.

When a Voice Generator is connected it should always answer any incoming calls. If the Voicegenerator for any reason does not answer incoming calls, the command ATSO=5 will make the modem answer after 5 rings. This will make the station available for data transmission.

When exiting this menu the new initialization commands will be transmitted to the modem. The commands will also be transmitted when the Datalogger is turned from OFF to ON position, and if the time since last transmission is more than 24 hours.

### Serial Settings

The settings in this menu will cause the RS-232C format on the “Last Reading” port to have different formats. By activating the [On/Off] field to the right on the LCD the different formats can be toggled ON and OFF.

```

>Serial Settings           [Exit]
Simple pr.out : OFF       [On/Off]
Time Print    : OFF       [On/Off]
Voltage Print : OFF       [On/Off]
```

#### Simple pr.out:

**ON** – Turns ON the simple printout format. This will enable the Datalogger to be connected to a computer with Display Program 3710 or other software using “AAICOMserver”.

The AAICOMServer is an ActiveX control designed for those who write Windows based software interfacing Aanderaa equipment. The “control” can be downloaded from:

<http://www.aanderaa.no/Software/updates.htm>

“Simple printout” format on “Last Reading” port:

**String example:** 346 673 1013 23

Character Number	Hex code	Description
1	20	Space.
2	31 or 20	Raw Data / Space if raw data is less than 1000.
3	31 - 39 or 20	Raw Data / Space if raw data is less than 100.
4	31 - 39 or 20	Raw Data / Space if raw data is less than 10.
5	30 - 39	Raw data.
6	0A	LF, only after last channel.
7	0D	CR, only after last channel.

**OFF** – Turns OFF the simple printout format and the default format ON.

Default format on "Last Reading" port:

String example: **02 Wind speed**

**12.5 m/s**

Character Number	Hex code	Description
1	30 to 39	Ch. Number
2	30 to 39	Ch. Number
3	20	Space
4	20 to 5A, 5C, 61 to 7A	Par. Name
5	20 to 5A, 5C, 61 to 7A	Par. Name
6	20 to 5A, 5C, 61 to 7A	Par. Name
7	20 to 5A, 5C, 61 to 7A	Par. Name
8	20 to 5A, 5C, 61 to 7A	Par. Name
9	20 to 5A, 5C, 61 to 7A	Par. Name
10	20 to 5A, 5C, 61 to 7A	Par. Name
11	20 to 5A, 5C, 61 to 7A	Par. Name
12	20 to 5A, 5C, 61 to 7A	Par. Name
13	20 to 5A, 5C, 61 to 7A	Par. Name
14	20 to 5A, 5C, 61 to 7A	Par. Name
15	20 to 5A, 5C, 61 to 7A	Par. Name
16	20 to 5A, 5C, 61 to 7A	Par. Name
17	20 to 5A, 5C, 61 to 7A	Par. Name
18	20 to 5A, 5C, 61 to 7A	Par. Name
19	20 to 5A, 5C, 61 to 7A	Par. Name
20	20 to 5A, 5C, 61 to 7A	Par. Name
21	20 to 5A, 5C, 61 to 7A	Par. Name
22	20 to 5A, 5C, 61 to 7A	Par. Name
23	20	Space
24	20 or 30 to 39	Sensor Reading / Space
25	20 or 30 to 39	Sensor Reading / Space
26	20 or 30 to 39	Sensor Reading / Space
27	20 or 30 to 39	Sensor Reading / Space
28	30 to 39	Sensor Reading
29	2E	Point
30	20 or 30 to 39	Sensor Reading Decimal / Space
31	20 or 30 to 39	Sensor Reading Decimal / Space
32	20	Space
33	20 to 5A, 5C, 61 to 7A	Unit name
34	20 to 5A, 5C, 61 to 7A	Unit name
35	20 to 5A, 5C, 61 to 7A	Unit name
36	20 to 5A, 5C, 61 to 7A	Unit name
37	20 to 5A, 5C, 61 to 7A	Unit name
38	0A	LF
39	0D	CR

Time Print:

**ON** – Turns ON the “Time Print” on the “Last Reading” port.

“Time Print” format on “Last Reading” port:

**String example: Date/Time: 1.03.01 13:13:00**

Character Number	Hex code	Description
1	44	D
2	61	a
3	74	t
4	65	e
5	2F	/
6	54	T
7	69	i
8	6D	m
9	65	e
10	3A	:
11	20	Space
12	20 or 31 to 33	Space/Day
13	30 to 39	Day
14	2E	.
15	30 to 31	Month
16	30 to 39	Month
17	2E	.
18	30 to 39	Year
19	30 to 39	Year
20	20	Space
21	30 to 32	Hour
22	30 to 39	Hour
23	3A	:
24	30 to 35	Minutes
25	30 to 39	Minutes
26	3A	:
27	30 to 35	Seconds
28	30 to 39	Seconds
29	0A	LF
30	0D	CR

**OFF** - Turns the time print on the “Last Reading” port OFF.

Voltage Print:

**ON** – Turns the voltage print ON.

Voltage print format on “Last Reading” port:

**String example: 00 Battery Voltage 14.3 volt**

For detailed description see the default format on “Last Reading” port.

**OFF** - Turns the “Battery Voltage” print OFF.

CHAPTER THREE

SERIAL COMMUNICATION:

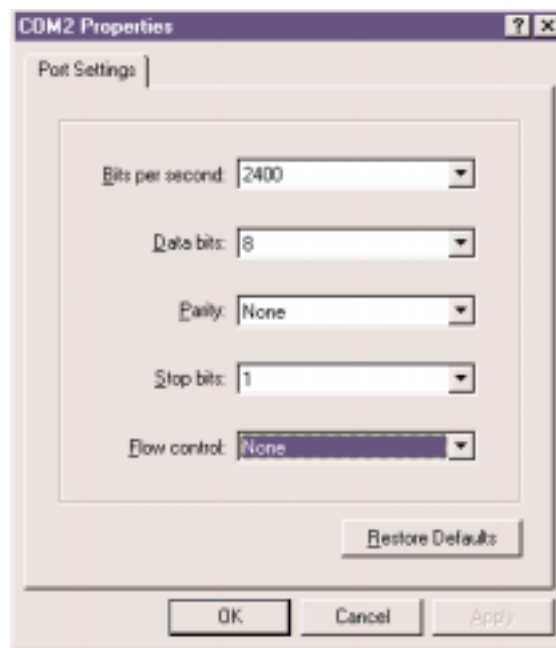
**Communicating with the Datalogger using HyperTerminal**

First check the baud rate of the Datalogger. Use the control switches and enter the “Set Baud Rate” menu. See page 7. Note the baud rate and turn the Datalogger OFF.

1. Start HyperTerminal and choose a name for the session. Under the “Connect using:” drop down menu, select the com-port on your computer where the Datalogger is to be connected.



2. Use the following settings. Bits per second should correspond to the setting of the Datalogger.



Connect Cable 3204 from the Datalogger’s **Com-Port** to the selected com-port on the computer. Set the mode switch of the Datalogger in the “Menu” position. The “Setup” menu should now appear on the screen. To retrieve data from memory see page 4-02.

## 12 Channel Settings

Is for entering, sensor parameter names, sensor unit names, A, B, C and D calibration coefficients. All these parameters are given in the calibration sheet following each sensor. In addition this menu is also for entering number of decimals each sensor reading is to be displayed and stored with, alarm high limits, alarm low limits and alarm repetition.

### Channel Settings

Channel (00)                      Arrow up-Previous channel, Arrow down-Next channel.

#### Parameter

[Battery Voltage     ]            1.Preset names: Use arrow up/down to cycle trough a list of pre-set parameter and unit names.

#### Unit

[Volt     ]                        2.To enter a new name: Use Ctrl-X or backspace to clear an editing field, then enter characters.

#### Number of Decimals

[1]

#### Coefficients

A:[+0.000E+00]

B:[+1.000E-02]

C:[+0.000E+00]

D:[+0.000E+00]

#### Note!

Ctrl-x removes all chars in editing field.

Ctrl-c loses current changes, and exit editing.

#### Alarms/Repetitions

Hi:Disabled

Lo:Disabled

## 13 Channel List

Prints an overview of sensor parameters.

### Channel List

Ch	Parameter	Unit	A/AlarmHI	B/HiRep	C/AlarmLO	D/LoRep	N	HL
00	Battery Voltage	Volt	+5.292E+00	+1.052E-02	+0.000E+00	+0.000E+00	1	DD
01	Reference		+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	0	DD
02	Wind speed	m/s	+0.000E+00	+7.770E-02	+0.000E+00	+0.000E+00	1	DD
03	Wind direction	Deg.M	+0.000E+00	+3.516E-01	+0.000E+00	+0.000E+00	1	DD
04	Air temperature	Deg.C	-4.404E+01	+8.140E-02	+9.190E-06	+0.000E+00	1	DD

## 14 Display Raw Data

Raw data in Aanderaa terms is a 10-bit number ranging from 0 to 1023. This setting applies to the data displayed on the LCD, the listing of historical data from the “Com. Port” and the data presented on the “Last Reading” port

### Show Raw Data Setting

Show raw data (Y/N)

## Setup Menu

```

Setup
13 March-2001
-----
Channel reading
-----
| 11 Last Data
| 12 Channel Settings
| 13 Channel List
| 14 Display Raw Data
| 15 Number of Channels
| 16 Recording Interval
| 17 Show Elapsed Sequence (Current Program)
| 18 Remote Start Trigger
-----
Misc
-----
| 21 Set Location and Owners Name
| 22 Set Date and Time
| 23 Set New Password
| 24 Call Statistics
| 25 Command mode
| 99 Quit/Hang-up
-----
Serial Settings
-----
| 31 Modem Init String
| 32 Set Baud Rate
| 33 RS232 Port Setting
| 34 Serial Setting
-----
Memory Settings
-----
| 41 Memory Setting
| 42 Sent to Voice
| 43 Clear All Data
| 44 Clear All Parameters
-----
Alarms
-----
| 51 Set Alarm Number
| 52 Set Alarm Interval
-----
<Enter> or ? to show this menu. To stop listing of menu, press 's'.
Enter menu Choice >

```

### 11. Last Data

Prints a listing of the last sensor readings.

```

Last Data
-----
00 Battery Voltage      10.2 Volt
01 Reference            186
02 Wind speed           12.5 m/s
03 Wind direction       123.7 Deg.M
04 Air temperature      23.8 Deg.C
-----

```

## 15 Number of Channels

Is for setting the active number of channels or sensors. If the message: “Error: To many channels, nothing done!” is shown, it means that the number of channels is too high for the current recording interval. The recording interval has to be increased. Enter the menu number 16 “Set Recording Interval”.

```
Set number of channels
-----
Select number of channels (Min:2 Max:18): 18
New number of channels is set to 18
```

## 16 Recording Interval

The memory status is shown followed by a list of possible recording intervals. In the example the 0.5 and 1.0 minute intervals are disabled. When the active number of channels is set to 18, it will take  $18 \times 4$  seconds to scan all channels. This is 72 second, which is more than 1 minute. The “Estimated memory full:” line, will indicate an estimated date when the internal memory is full. If “Remote start” is selected estimation is not applicable.

```
Info
-----
With 18 channels at 2.0 min interval:
Estimated memory full: 15 March 01
Storing cap. left ...: 2468 logs(18 ch.)
Storing cap. left ...: 44424 words
Current memory status.....
Memory free..... : 68.0%
Memory used..... : 32.0%
Number of logs stored : 2154
Number of words stored : 15677

Set Interval
-----
0 Remote start      4      2.0 min.      8      30.0 min.
1 Nonstop           5      5.0 min.      9      60.0 min.
2 ( 0.5 min.) *    6     10.0 min.    10     120.0 min.
3 ( 1.0 min.) *    7     20.0 min.    11     180.0 min.
-----
* Disabled because reading 18 channels takes longer time

Select interval:
```

### Remote start mode:

No scheduled readings, only a +5 volt “Remote start pulse” at the PDC-4 pin will start a reading cycle. A “Remote start pulse” will also start a reading cycle while in normal “time scheduled mode”, but only if there is enough time to complete the cycle before the scheduled time.

### Nonstop mode:

The Datalogger reads the sensors consecutively without any intermission between recordings.

**17 Show Elapsed Sequence (Current Program)**

Prints elapsed time since last reading and time to next reading.

Will also print the sensor readings while the Datalogger is scanning sensors.

```
Show Time
-----
To stop - press 's'
-----

0:00:41 - Time to next measure
0:01:18 - Time since last measure
```

**18 Remote Start Trigger**

While the Datalogger is in normal “time scheduled interval mode” or in “remote start mode”; this will start a reading cycle. The reading cycle will only start if there is enough time to complete the cycle before the scheduled time.

```
Remote Start Trigger
-----
Reading is started!

Show Channels
-----
To stop list- press 's' or Ctrl-c
-----

Interval:   2.0 min.   No.of channels:  2

01 Reference           186
02 Wind speed         12.5 m/s
```

**21 Set Location and Owners Name**

User selectable text can be entered here (31 characters).

To remove all characters in field, press Ctrl-X.

```
Owners name: (Owner's Name           )
Location   : (Location               )
```

**22 Set Date and Time**

Enter the new date/time in the “(20010312 )” field.

```
Set Date and Time
-----
Syntax: YYYYMMDDHHmmSS
       YYYY=Year,MM=Month,DD=Day,HH=Hour,mm=Minute,SS=Seconds.
       The number of characters represents the number of digits to be used.
       Seconds are optional. If not written, seconds are set to 00.

Current time : 12 March-2001 13:38:24
-----
Enter new Date/Time:(20010312      )
```

### 23 Set New Password

When delivered from factory the default password is “3634” or “3660”.

Maximum number of characters in a password is 18.

```

Password
-----
Enter new password >****
Re-enter to verify >****
New password is set

```

### 24 View number of calls

Prints the number of telephone calls made to the Datalogger.

```

Number of calls
-----
Number of Modem Calls:      9
Number of Voice Calls:     0
-----
Total Number of Calls:     9

```

### 25 Command mode

This mode is for listing historical data and for using the “Macro Language” described in TD205. The “Macro Language” can be downloaded from <http://www.aanderaa.no/Datalog3660.htm>. For details on how to list historical data, see page 4-02.

```

Command mode
-----
Type 'setup' to return to setup menu.
-----

Command >

```

### 99 Quit/Hang-up

Exits the programming mode.

### 31 Modem Init String

In this menu initialization commands to a modem can be set. The Datalogger contains a set of default initialization commands. The default commands will operate with the most common modem types. If transmission problems occur when trying to retrieve data from the Datalogger, the user has to alter or add new “AT” commands to the initialization string. Referring to the modem manual check if the following default “AT” commands has the same meaning as listed below.

#### Default Modem Init String:

AT&F	– Restore factory configuration
AT&Q0	– Direct mode
AT&K0	– Disable flow control
AT&D0	– Ignore DTR signal
ATE0	– Local Echo off
AT&W	– Store active profile

A total of 10 commands can be set. All commands have to begin with capital “AT” to be accepted. The default command list has a command named MVSET (ModemVoiceSET). This command has to be set in all cases. It is a substitute for the commands ATSO=1 (autoanswer) and ATSO=5 (autoanswer after 5 rings). If the “Last Reading” port is set to PC, then the ATSO=1 command is sent. If the “Last Reading” port is set to Voice, the ATSO=5 command is sent.

When a Voice Generator is connected it should always answer any incoming telephone calls. If the Voicegenerator for any reason does not answer incoming calls, the command ATSO=5 will make the modem answer after 5 rings. This will make the station available for data transmission. When exiting this menu the new initialization commands will be transmitted to the modem. The commands will also be transmitted when the Datalogger is turned from OFF to ON position, and if the time since last transmission is more than 24 hours.

To remove all characters and go to the first position in a field, press Ctrl-X or use backspace.

```

Modem Init List
-----
00 [AT&F           ]    05 [MVSET           ]
01 [AT&Q0          ]    06 [AT&W           ]
02 [AT&K0          ]    07 [                ]
03 [AT&D0          ]    08 [                ]
04 [ATE0           ]    09 [                ]
-----
Enter modem init command number: 07(

```

### 32 Set Baud Rate

This menu is for setting the baud rate on the “Last Reading” port and the “Com-Port”. The selected baud rate is valid for both ports. To activate the new baud rate select 99 to end the current session. Then turn the Datalogger OFF and ON again.

```

Set new baud rate
-----
Current Baud rate is: 2400 baud
Next Baud rate is   : Same as current.

0 - 1200   1 - 2400   2 - 4800   3 - 9600
Enter choice :

```

### 33 Last Reading port Setup

This menu is for selecting device connected to the Last Reading port. PC or Voice can be selected.

```

Last Reading Port Setup
-----
Is the "Last Reading" port connected to a VOICE? (Y/N)NO
The "Last Reading" port is set to: PC

```

### 34 Serial Setting

The settings in this menu will cause the “Last Reading” port to have different formats. For full description on formats, see pages 2-08 to 2-10.

Simple Printout

Time stamp

Battery Voltage

```
Last Reading Port Setup
-----
```

```
Is the "Last Reading" port connected to a VOICE? (Y/N)NO
The "Last Reading" port is set to: PC
```

### 41 Memory Setting

The user can select to skip or add channels to be stored in the internal memory.

```
Memory Settings
-----
```

```
Store "Battery Voltage" channel (Ch.0)(Y/N)
Store "Reference" channel (Ch.1)(Y/N)
Stop logging new data when memory is full(Y/N)
```

### 42 Sent to Voice

This menu is to prevent a faulty sensor reading to be relayed to the Voice Generator 3420. Enter the channel number to change the status from SENT to, is NOT SENT.

```
Channels Sent to Voice
-----
```

```
00 Battery Voltage      : Not Sent      02 Wind speed          : Sent
01 Reference            : Not Sent      03 Wind direction      : Sent
```

```
-----
Enter channel number to alter between Sent/Not Sent.
To Exit -> enter an empty channel.
Channel:
```

### 43 Clear All Data

Will clear all data from the internal memory. Sensor parameters will not be deleted.

```
Clear all data?
```

```
Are you sure (Y/N)y
```

```
Error: Answer with CAPITAL letters: (Y/N)Y
```

```
All data are deleted!
```

### 44 Clear All Parameters

Will clear all sensor parameters from the internal memory. Data will not be deleted.

```
Clear all parameters?
```

```
Are you sure (Y/N)y
```

```
Error: Answer with CAPITAL letters: (Y/N)Y
```

```
All parameters are set to default state!
```

### 51 Set Alarm Number

This menu is for selecting alarm type and alarm telephone number. In order for the alarms to operate they have to be ENABLED and alarm limits has to be set. This is done in menu number "12 Channel Settings". There are three types of alarm modes: PAGER, MODEM and LINE.

```
0 - Pager   1 - Modem   2 - Line
Enter type of device the alarm
is to be sent to: 1
Alarmnumber: (          )
```

#### Pager:

Usually some extra "AT" commands needs to be added to the modem initialization string to get this mode to operate correctly. However this will depend on the pager system in various countries and the modem connected to the Datalogger. When an alarm is triggered the Datalogger will make the modem dial the alarm number. After the alarm number is dialed, there has to be a pause before the pager system is ready to receive the alarm code. The "S8" register in the modem specifies the pause time. In the example below an extra command, "ATS8=10" is added to the modem initialization string: This will give a pause time of 10 seconds pr. comma.

Example:

Alarm number entered by user: "0W99228844,,,"  
 Dial prefix "0" to get access to an outside line \_\_\_\_\_  
 Wait for new dial tone \_\_\_\_\_  
 Telephone number to pager system \_\_\_\_\_  
 Three commas indicating a pause time of 30 seconds \_\_\_\_\_

Alarm code example: 0343121  
 Datalogger's reference reading \_\_\_\_\_  
 Channel number \_\_\_\_\_  
 Alarm high (0 = alarm low) \_\_\_\_\_

#### Modem:

This mode will need an alarm number. When connection is established between the modem connected to the Datalogger and the modem receiving the alarm, an alarm string is transmitted.

Example: "Location , Water Level : Alarm HI"

#### Line:

With the alarm type set to LINE, an alarm number is not required. When an alarm is triggered, the alarm string, as for MODEM, is sent to the "Com Port".

### 52 Set Alarm Interval

In order for the alarm repetition interval to operate, the alarms have to be ENABLED and repetition has to be set ON. This is done in menu number "12 Channel Settings". The alarm will be sent when the alarm high or alarm low values are exceeded. If repetition property is set ON, the alarm will be repeated with the time specified in this menu. It will continue repeating as long as the alarm high or alarm low values are exceeded. Minimum repetition interval is 10 minutes and maximum interval is 99 minutes. Clear the field with Ctrl-X or backspace before entering new repetition time.

```
Set Alarm Interval
-----
Alarm interval must not be less than 10 minutes!
Enter alarm interval in minutes:(10)
Interval is set to 10 minutes
```

## CHAPTER FOUR

MODEM COMMUNICATION

Connect a modem to the Datalogger's "Com Port" by using "Cable 2842" for "Field Modem 3431", or "Cable 3205" for other modems with 25-pin data plug. Turn the Datalogger OFF and then ON again. This will make the Datalogger send the initialization string to the modem.

By using a computer with modem and communication software like "HyperTerminal" or "ProComm", settings in the Datalogger can be accessed. Historical data can also be downloaded. In the communication software, set the baud rate to correspond with the Datalogger's and use 8 data bits, 2 stop, bit and no flow control. See the communication software's help file for details on how to set-up the software for dialing a telephone number.

When dialing a Datalogger by modem, the last data set will be received.

```

                                DATA LOGGER 3660
                                AANDERAA INSTRUMENTS-HOP WL-Stn

InfoT:+4755132500 F:+4755137950      Recording Int: 10.0 min.Date: 15/2-2000
-----
Parameter                Unit          Reading
                                7:28
-----
01 Reference                647
02 Air temperature          Deg.C      2.5
03 Rainfall                 mm         0.08
04 Battery Voltage          Volt       12.4
06 Water level              W m        2.84
07 Water temperature        Deg.C      2.45
-----
                                A system from Aanderaa Instruments ----

For help - write help at command prompt!

Command >

```

By entering commands at the command prompt, historical data can be listed or the "Setup menu" can be entered. To get online help, enter "help" at the command prompt. All commands available in command mode are listed below.

```

Command >help
-----
Help
-----
list           Lists historical data, newer readings -> older
listbackward  As for list
lb            As for list
listforward   Lists historical data, older readings -> newer
lf           As for listforward
              Optional a time period may be added to the list commands.
              Syntax: list <from time> - <to time>
              Time syntax: YYYYMMDDHHmmSS YYYY-year,MM-month,DD-day
              HH-hour,mm-min,SS-sec. Seconds are optional
              Starting time or stop time may be skipped.
              Example: list 200101011500 - 200101011400
setup          Enters setup menu
quit          Terminates communication

Command >

```

## Enter Setup menu

### By modem

Dial the Datalogger and enter “Setup” at the command prompt.

Enter password. Default password is 3634 or 3660.

For description on the different items in the setup see pages 3-02 to 3-09.

### By Cable 3204

See page 3-01.

## Retrieve data from memory using HyperTerminal

See the above description on how to enter the Setup menu.

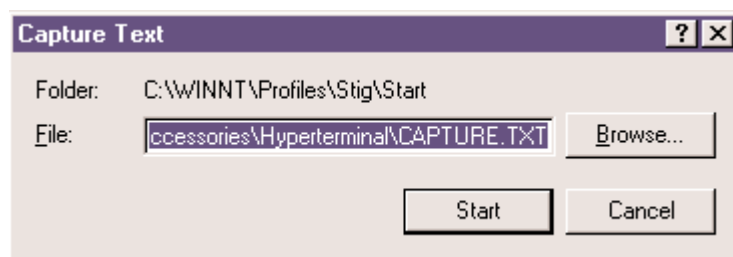
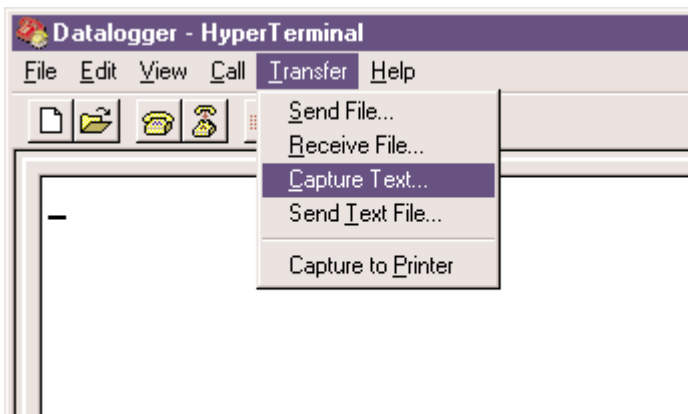
In the “Setup menu” select item number 25 “Command mode”.

Select “Capture text” under the “Transfer” drop down menu.

Choose a name for the capture file. Default is “CAPTURE.TXT”.

Note the folder where the file is located.

Select “Start”.



Enter a command for listing of data. Possible commands are:

**listbackward**      - Lists historical data, starts with the most recent data.  
- **list** and **lb** can also be used.

**listforward**      - Lists historical data, starts with the oldest data.  
- **lf** can also be used.

**Retrieve data from a specific time period within the Datalogger's memory.**

The example will list data from 1.March 2001 at 15:00:00 to 1.March 2001 14:00:00.

Example: `listbackward 20010301150000 - 20010301140000`

Syntax: `listbackward YYYYMMDDHHmmSS - YYYYMMDDHHmmSS`

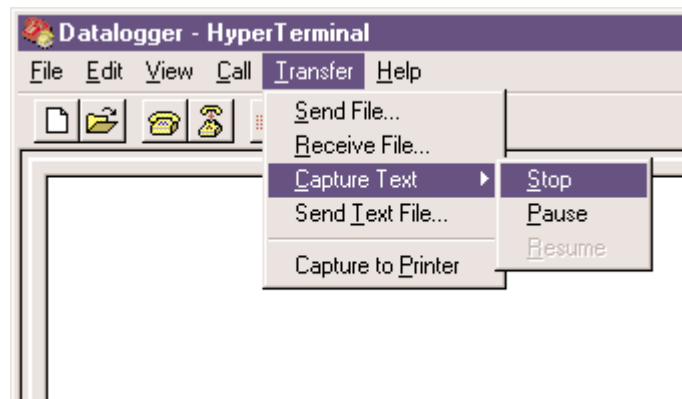
Y = year, M = month, D = day, H = hour, m = min, S = sec. Seconds are optional.

If the data is to be listed the other way around starting with 1.March 2001 14:00:00 the command list-forward should be used.

The Datalogger will run through its memory searching for the time period specified before it starts to transmit data. This can take some minutes.

```
Command >list
Time/Date : 13 March-2001 12:43:00
Time      BattVolt Ch002      Ch003
12:43     10.2      12.5      123.7
12:41     10.2      12.5      123.7
12:39     10.2      12.5      123.7
12:37     10.2      12.5      123.7
```

When finished select "Stop" under the "Transfer" drop down menu.



Now all the data are stored in a text file.

To insert the data into a spreadsheet use the "3660 List converter" software, which is a free utility program that can be downloaded from our website at: <http://www.aanderaa.no/Datalog3660.htm>

## CHAPTER FIVE

MISCELLANEOUS AND TROUBLE SHOOTING**Calculation of Engineering Units**

The Datalogger is using the following formula to convert raw data into engineering units.

$$E = A + B*N + C*N^2 + D*N^3$$

- E - converted value in engineering units  
 A, B, C, D - calibration coefficients given in the sensor's calibration sheet.  
 N - raw data values measured by the Datalogger.

**Combine two 10-bit channels into one 20-bit channel**

Insert the letter 'W', in two following channels, in the last position of the parameter name. There has to be at least one "space" in front of the 'W'. The first channel will contain the 10 MSB and the second channel will contain the 10 LSB.

Example:

Ch	Parameter	Unit	A/AlarHI	B/HiRep	C/AlarmLO	D/LoRep	N	HL
00	Battery Voltage	Volt	+5.292E+00	+1.052E-02	+0.000E+00	+0.000E+00	1	DD
01	Reference		+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	0	DD
02	Water level	W m	+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	1	DD
03	Water level	W m	+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	1	DD

The Datalogger will combine channel 2 and 3. The resulting raw data will be calculated using the formula:  
 $N = (\text{raw\_data\_reading\_in\_Ch2} * 1024) + (\text{raw\_data\_reading\_in\_Ch3})$

Calibration coefficients are programmed into the LSB channel.

Engineering units is calculated as shown under **Calculation of Engineering Units**.

**Present Dewpoint as a Virtual channel.**

Calculation of dewpoint is built into the Datalogger. To perform dewpoint calculation there has to be an Air Temperature sensor and a Relative Humidity sensor connected to the Datalogger. Three letters needs to be placed in the last position of the parameter names. There has to be at least one space before the letters.

T - Air Temperature in Deg.C

H - Relative Humidity in %RH

D - Dewpoint channel. Presented in Deg.C.

Example:

Ch	Parameter	Unit	A/AlarmHI	B/HiRep	C/AlarmLO	D/LoRep	N	HL
00	Battery Voltage	Volt	+5.292E+00	+1.052E-02	+0.000E+00	+0.000E+00	1	DD
01	Reference		+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	0	DD
02	Air temperature	T Deg.C	+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	1	DD
03	Relative humidity	H %RH	+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	2	DD
04	Dewpoint	D Deg.C	+0.000E+00	+1.000E+00	+0.000E+00	+0.000E+00	1	DD



**Default Setting**

**These are the settings for the datalogger when not delivered as a part of a system.**

Number of Channels . . . . . **5(3634), 12(3660)**  
 Recording Interval. . . . . **10 minutes**  
 Show Raw Data. . . . . **OFF**  
 Buzzer. . . . . **OFF**

CHANNEL 0. . . . . Parameter name: **Battery Voltage**, Unit Name: **Volt**, Decimals: **1**  
 Coefficients: **A:+5.292E+00 C: +0.000E+00**  
**B:+1.052E -02 D: +0.000E+00**

CHANNEL 1. . . . . Parameter name: **Reference**, Unit Name:, Decimals: **0**  
 Coefficients: **A:+0.000E+00 C: +0.000E+00**  
**B:+1.000E+00 D: +0.000E+00**

ALL OTHER CHANNELS . . . . . Parameter name: , Unit Name: , Decimals: **1**  
 Coefficients: **A:+0.000E+00 C: +0.000E+00**

**B:+1.000E+00 D: +0.000E+00**

Last Reading Port . . . . . **PC**  
 Baud Rate . . . . . **2400**  
 Print out of Time /Date . . . . . **OFF**  
 Print out of Battery Voltage . . . . . **OFF**  
 Simple Output (3010) . . . . . **OFF**

**MEMORY SETTINGS**

Battery Voltage . . . . . **Not Stored**  
 Reference. . . . . **Stored**

**Delete Oldest Data** when the Memory is Full

**MODEM INIT. COMMANDS**

Modeminit 0, . . . . . **AT&F**  
 Modeminit 1,. . . . . **AT&Q0**  
 Modeminit 2,. . . . . **AT&D0**  
 Modeminit 3,. . . . . **ATE0**  
 Modeminit 4,. . . . . **MVSET**  
 Modeminit 5,. . . . . **AT&W**

**CHANNELS SENT TO VOICE**

Battery Voltage . . . . . **Notsent**  
 Reference . . . . . **Notsent**  
 All other Channels. . . . . **Sent**

**ALARM SETTINGS**

Hialarm. . . . . **Disabled, No repetition**  
 Loalarm. . . . . **Disabled, No repetition**

**ALARM ENABLED**

Hialarm. . . . . **+0.000E+00**  
 Loalarm. . . . . **+0.000E+00**  
 Alarmtype . . . . . **Pager**

**INTERVAL ENABLED**

Alarminterval . . . . . **10 minutes**

**When the datalogger is delivered as a part of a system.**

The unit is normally programmed for the sensors connected and the system application when delivered.

## Trouble Shooting Chart

<p><b>1. Station does not start</b></p>	<p><b>Insufficient power supply</b></p> <p><b>Improper connections</b></p> <p><b>Malfunctioning Scanner or Datalogger</b></p>	<p><b>Disconnect the power supply.</b> Measure voltage from power supply. If no voltage, replace power supply.</p> <p><b>Check all cables connections and seatings on sensor arm</b> Check sensors for possible damage.</p> <p><b>If powersupply and cables are OK, send Scanner / Datalogger to factory for repair.</b></p>
<p><b>2. Erratic Reference reading</b></p>	<p><b>Insufficient power supply</b></p> <p><b>Faulty reference-resistors</b></p> <p><b>Malfunctioning Scanner or Datalogger</b></p> <p><b>Faulty sensor</b></p>	<p><b>See above.</b></p> <p><b>Disconnect all sensor cables from Scanner / Datalogger.</b> Connect test plug 3106, 3418 or 3419 if available to the Scanner / Datalogger. If reference reading is still erratic and the readings from the testplugs is within <math>\pm 1</math> of the value printed on the test plug the internal reference resistors needs to be replaced. Send Scanner / Datalogger to factory for repair.</p> <p><b>If no test plug is available and reference reading is still erratic, send Scanner / Datalogger to factory for repair.</b></p> <p><b>Disconnect all sensors from the sensor arm and the Scanner / Datalogger.</b> Connect one sensor at a time and check reference reading. Replace the sensor that effects the reference reading more than <math>\pm 1</math>.</p>
<p><b>3. Faulty sensor readings</b></p>	<p><b>Faulty sensor</b></p> <p><b>Faulty mast cable</b></p> <p><b>Faulty Sensor Arm</b></p>	<p><b>Disconnect the sensor from the sensor arm or the Scanner / Datalogger.</b> Check O-rings and connectors for leakage. Install test plug 3106, 3418 or 3419 if available on the sensor arm or Scanner / Datalogger and check that the readings are within <math>\pm 1</math> of the value printed on the testplugs. Make sure the connectors are dry and replace O-rings if damaged before reconnecting the sensor. If sensor still have faulty readings send sensor to factory for repair.</p> <p><b>Disconnect sensors from the sensor arm.</b> Install testplug 3419 on the sensor arm and check that the readings are within <math>\pm 1</math> of the value printed on the test plug. If readings are incorrect replace mast cable.</p> <p><b>If readings are still incorrect replace sensor arm.</b></p>