



COMPUTING UNIT 3015

Converts raw data from remotely placed field stations or data buoys into data in engineering units. This unit can be interrogated by telephone and is to be understood as a part of a remotely located field station.

Aanderaa Instruments manufactures a variety of oceanographical and meteorological instruments. The Computing Unit 3015 is designed to receive data from these instruments, convert the data and present them in engineering units. Data are transferred from the instruments to the 3015 unit either via cable or by VHF radio transmission providing the receiving point is within line of sight.

The Computing Unit 3015 is a waterproof totally encapsulated unit that can be used under harsh climatic conditions. It is furnished with a 4 line / 40 characters Liquid Crystal Display, a mode switch and a set of watertight receptacles for electrical connections. It is designed for wall mounting. The unit is powered by 9V DC through an AC/DC Adapter. If power is lost the 3015 will retain its programmed information due to an internal back-up battery.

A Programming Pad 3262 is available for programming, but normally programming is done from a PC terminal.

The unit must be programmed before use for the field station or buoy it shall handle data from. The programming is normally done at the factory before delivery but can also be done later following the procedure on page 4. When properly programmed the unit is ready for use. When a data set arrives, normally every 10 minutes, the LCD will show the station's reference number followed by the subsequent sensor channels, giving its parameter names, units and readings. The 3015 will only accept data that starts with the

programmed reference number (± 2) and the programmed number of channels.

When the last 10-bit word of a data set is received, the unit switches into a computing phase which calculates the 3hr average, the 24hr maximum, minimum and average values for each channel received and edits a «Diurnal Picture». This picture is accessible when a printer or a screen is connected either directly or via telephone with modem.

When the computing phase is completed, ASCII-coded data are available at the output receptacles. The receptacle marked «Last Reading» is for external storage or infeed of data to a computer. The other receptacles enable printer, CRT, Modem and Voice Generator 3420 to be connected.

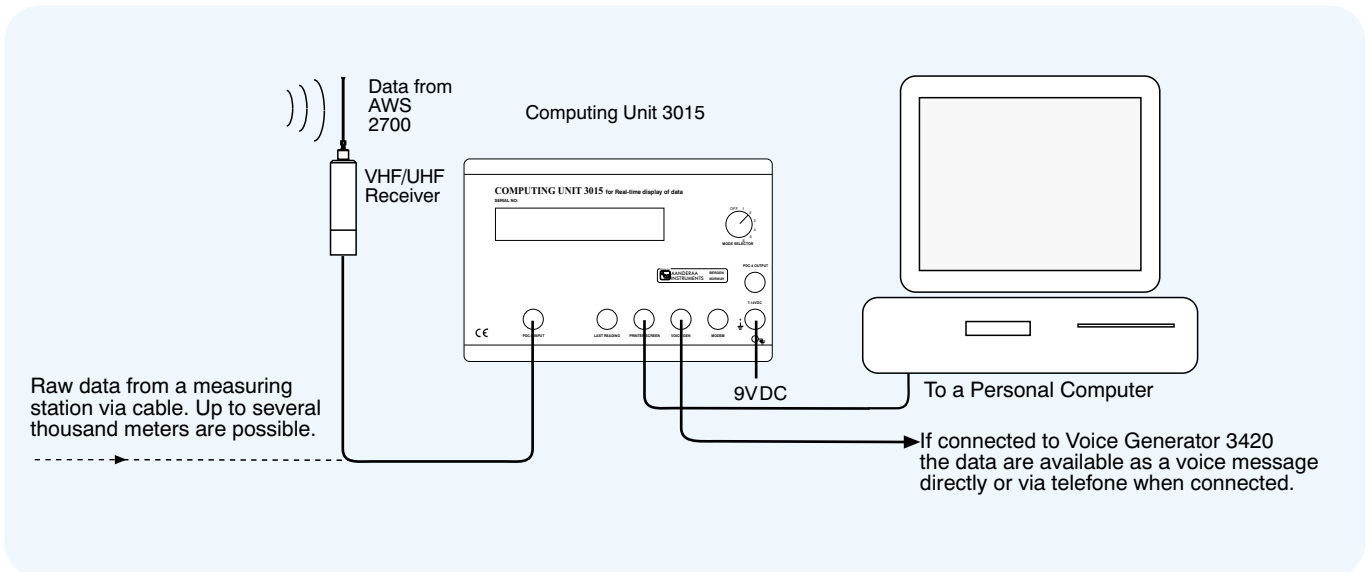
Raw data in 10-bit code can also be stored using a data storage unit (DSU) 2990 connected to the PDC-4 output.

When the mode switch is in the normal operating position MODE 1 the unit will, while awaiting new data, show on the LCD:

- the last incoming and expected reference number
- the number of data sets received the last 3 and 24 hours
- the location of the station that it is programmed for
- elapsed time since the last data set was received
- the number of telephone calls to the station

The drawing below shows a typical usage of the 3015 unit. Raw data from a field station, either by cable or via UHF/VHF radio is routed to the 3015, converted into engineering units and displayed, channel-by-channel, on the LCD. A Personal

Computer connected to the 3015 unit will display the Diurnal Picture shown below. Data are also available as a voice message if the Voice Generator 3420 is connected and as ASCII coded signals if an external modem is connected.



The Diurnal Picture provided by 3015 is a way of showing data from Moored Data Buoys, Automatic Weather Stations and other field measuring stations on a CRT screen. It specifies the parameters measured, the units used, and it tells whether the buoy or station operates correctly or not.

The Diurnal Picture should be available for all stations and buoys. The Computing Unit 3015 provides such a picture over the telephone when connected to a modem.

The picture also shows whether the transmission of data is reliable and how many telephone calls the Computing Unit has received. The information provided in this picture is almost essential for successful operation of such stations, and must be understood as a technical test and information

The unit has an output for the Last Reading, without parameter names and units. The data are presented as a string, first the time when data was recorded and then the data readings. This string is also available at the modem receptacle when the command LD is given. This saves transfer time when data from more than one station are required. See example at the bottom of the page. *

AANDERAA ENVIRONMENTAL DATA								
DIURNAL PICTURE								
Stadlandet, 485m, 62.9N 5.2E			Updating rate: 10 min.			Date: 23/4-91		
Calls: 254/183			Reading	3 hrs	18	24 hrs	144 data-sets	
Parameter	Unit		10:40	AVR	MAX	MIN	AVR	
2 Wind Speed	V m/s		7.5	5.1	11.7	1.6	6.9	
3 Wind Gust	G m/s		11.1	11.1	15.9	-	-	
4 Wind Direction	A Deg.M		227.3	215.5	228.7	24.2	54.6	
5 Air Temperature	Deg.C		0.8	0.2	0.8	-1.1	-0.3	
6 Relative Humidity	%RH		89.3	83.0	97.8	77.7	84.8	
7 Air Pressure (QNH)	mb		1015.9	1015.6	1016.5	1007.7	1013.9	
8 Sunshine Duration	S min		1.0	153.0	-	-	537.0	
9 Net Radiation	W/sqm		467.9	293.3	471.9	-11.8	121.8	
10 Rainfall	T mm		0.0	0.0	0.0	-	0.0	
11 Snow Depth	m		0.0	0.0	0.2	0.0	0.1	
12 Ground Temp.	Deg.C		0.5	0.3	0.5	0.1	0.3	

A System from Aanderaa Instruments -----

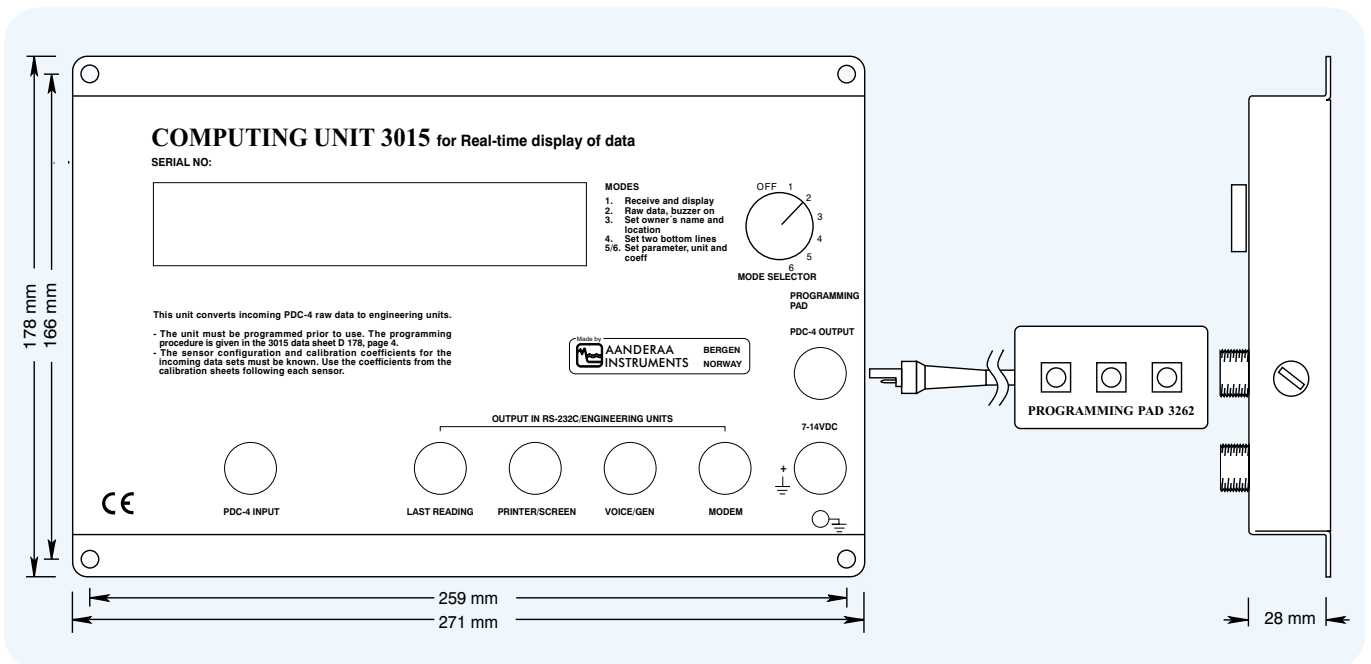
DIAL +55 132500 FOR STATION INFO.

* Data presented on the Last Reading output receptacle is as follows (Data under Reading in the above Diurnal Picture):
 1040 7.5 11.1 227.3 0.8 89.3 1015.9 1.0 467.9 0.0 0.0 0.5

SPECIFICATIONS FOR COMPUTING UNIT 3015

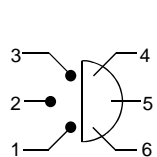
AANDERAA INSTRUMENTS

Input Signal:	Aanderaa PDC-4 code. Interval set by transmitting station, normally every 10 minutes	Mode Switch:	1- Receive and display 2- Raw data, Buzzer on 3- Set owner's name and location 4- Set 2 bottom lines 5/6-Set parameter, unit and coefficients
PDC-4 Output:	Equal to PDC-4 input signal (available if the incoming Reference signal is accepted)	Buzzer; Mode 1:	Accepted reference number is indicated by a short beep
Output Signals:		Mode 2:	Denotes incoming PDC-4 words
- Printer/CRT-Voice Gen.	RS-232C/ASCII code, 1200 baud	Internal Storage:	The last 432 data sets are stored together with time and date info
- Last Reading	8 data bits, 1 stop bit, no parity, no handshake	Operating Temperature:	-40 to +60°C (LCD illegible under -15°C)
- Modem:	RS-232C/ASCII code, 1200 baud, 8 data bits, 1 stop bit, no parity, DCD handshake	Material and Finish:	Polyurethane molding with hard anodized aluminum case
Power Supply:	7-14V DC	Weight:	1.1 kg
Current Consumption:	20mA	Warranty:	Two years against faulty materials and workmanship
Connectors:	Aanderaa 6-pin Plug 2828	Accessories (included):	Programming Pad 3262 Data/Programming Cable 3204 for PC
Display:	Alphanumeric 4 lines, 40-char. LCD	(optional):	AC/DC Adapter 3786 100-220V AC/9V 3A



PIN CONFIGURATION

Receptacle, exterior view; bushing = ; pin = ●



PDC-4 IN	PDC-4 OUT
1. System ground	1. System ground
2. Not used	2. Contr.volt (-6V)
3. -9V DC	3. -9V DC
4. Not used	4. Not used
5. PDC-4 input	5. PDC-4 output
6. Not used	6. Not used

RS-232C/ENGINEERING UNITS

LAST READING	PRINTER/CRT	VOICE GEN.	MODEM
1. System ground	1. System ground	1. System ground	1. System ground
2. Not used	2. Not used	2. Voice control	2. DCD
3. -9V DC	3. -9V DC	3. -9V DC	3. -9V DC
4. Not used	4. Not used	4. Ring	4. PROG
5. Not used	5. Not used	5. RX	5. RX
6. TX	6. TX	6. TX	6. TX

PROGRAMMING

Before use the 3015 must be programmed for its application. This is normally done before delivery but can also be done by the user.

The 3015 can be programmed by connecting cable 3204 from the modem receptacle to a PC terminal. When connecting the cable to the 3015 a menu will appear on the screen and «TERMINAL CONNECTED» is shown on the LCD. The commands in the menu are accepted after pressing «ENTER». Alternatively the 3015 can be programmed via telephone by modem. To get access to the programming mode a password must be entered within 10sec. after the Diurnal Picture has been received. If during one minute, no characters are entered, the 3015 will leave the programming mode and return to mode 1.

When programming with Programming Pad 3262 use the POS button to move the cursor, the CHAR button to select the desired character and the SHIFT button to alter between capital and small letters.

PASSWORD

The password may contain 11 characters and has two functions. One is for use in an «open» system and the other is for use in a system with «restricted access».

In an «open» system anyone can get data from the station, but they cannot enter the programming mode without the password.

In a system with «restricted access» a password is needed to get data from the station and to enter the programming mode. If «restricted access» is required, type the default password «3015» and select the letter W from the menu. The 3015 will then ask if you want to change the password, and if you want «restricted access» to the station.

When dialed, the 3015 will ask for a password and answer «ready» if the correct password is given.

THE LAST SET OF DATA

When dialing a 3015 unit and «ready» appears on the screen you are free to select between a full Diurnal Picture or only the last set of data. If only the last set of data is required, type the command «LD». To save transfer time, the parameter names and units are omitted. Only a stream of data is received. If no commands are sent the Diurnal Picture will be received.

ADDITIONAL INFORMATION

Voice Generator 3420/Field Modem 3431

Connected to a 3015 unit the Voice Generator 3420 will read the parameter names, data and units from the latest measurements as a voice message. The Field Modem 3431 is a rugged, watertight unit for transferring digital signals over the telephone network. It is powered by 9VDC from the 3015 unit.

Protecting the power input.

When the 3015 is operated with risks of spikes on the power line or large common mode voltages between the telephone line and the power line, a protection transformer 912006 is recommended.

HISTORICAL DATA

A complete list of historical data from the last 3days (432 data sets), using a 10-minute updating rate, can be listed. By sending the command «WFNJ» after «ready» or after the Diurnal Picture has been received, these data are listed backwards in time i.e. the last data first. The data can also be listed forward i.e. the oldest data first, by sending the command «JNFW».

SPECIAL HANDLING OF PARAMETERS

Some parameters require special handling to give the best possible interpretation of the sensor reading.

During programming the parameters should be marked with one of the letters given below. The letter must be entered in position 19 of the parameter name after a space.

- V - performs vector averaging using this reading as a radius
- G - shows 3hrs maximum instead of average
(When used on Wind gust minimum value is omitted)
- A - performs vector averaging using this reading as an angle
- M - shows 3hrs maximum rather than average
- S - calculates totals rather than averages
- T - same as S, but minimum value is omitted when used on Rainfall
- N - same as S, but maximum and minimum values are omitted
- C - a dash will be shown when there has been no rainfall. Used for Conductivity of Rainwater Sensor only
- L - calculates 25hour average rather than 24hours average. Used for Water Level Sensor only
- W - when two following channels are marked with W, these channels are combined to make a 20-bit word
- R - indicates that raw data is shown
- D - dew-point is calculated in this channel *
- t - temperature in the dew-point calculation
- H - relative humidity in the dew-point calculation

* Dew-point is not a sensor. It is a calculated value based upon the air temperature and the relative humidity.

Cables for use with the Computing Unit 3015.

From VHF Receiver 3096 to 3015	Cable 2852
From Sensor Scanning Unit 3010 to 3015	Cable 2842
From 3015 to Data Storage Unit 2990	Cable 2842
From 3015 to Voice Generator 3420	Cable 3296
From 3015 to PC/CRT	Cable 3204
From 3015 to Field Modem 3431	Cable 2842
From 3015 to Printer (Epson)	Cable 3206
From 3015 to Printer (Seiko)	Cable 3279
From External Modem	Cable 3205

Representatives' Stamp



Latest version is on the Internet

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