



AANDERAA INSTRUMENTS

DATA COLLECTING INSTRUMENTS FOR LAND SEA AND AIR



SENSOR SCANNING UNIT 3010

A rugged unit for scanning Aanderaa sensors in the field, and for enabling telemetry and on-site storage of data.

Sensor Scanning Unit 3010 is a compact, electronic device for scanning and reading a set of Aanderaa sensors. It is of a rugged, watertight design intended for use in the Aanderaa Automatic Weather Stations and for other field datalogging applications.

The electronic components are molded in scotchcast and housed in an anodized aluminum case. All switches and electrical connections are on the front of the housing which is prepared for wall mounting. The 3010 contains a 12 channel multiplexer, an R-2R network for analog to digital conversion and a digital control system that includes a microprocessor.

Input signals from the sensors may either be routed through the 18-pin mast cable receptacle (for the Aanderaa Automatic Weather Station) or the separate sensor receptacles. Up to 12 channels are available, selectable by means of a switch. The method used for the analog to digital conversion, a balanced full bridge system, provides full accuracy without the use of a stabilized voltage. By using pulsed bridge voltage, digital sensors of the shift-register type (SR-10) can be connected to the analog inputs without any kind of interfacing. The pulsed bridge voltage also keeps power consumption low, as does the use of CMOS electronic components.

A built-in high accuracy quartz clock generates the trigger pulse for the unit. When triggered, the unit scans the preset number of input channels in sequence. The R-2R network converts the sensor signal by successive approximation into raw data words in 10-bit binary code, which are fed to the

PDC-4 (Pulse Duration Code of 4 seconds) and RS-232C output receptacles. The two PDC-4 output receptacles are for connecting the Data Storage Unit 2990 for on-site recording of data and for telemetering of data either via VHF Transmitter 3149 or via a long cable. After the last sensor has been read, a sync pulse denotes the end of a complete measurement cycle. The RS-232C output is for direct connection to a computer. A liquid crystal display shows raw data after each sensor's reading, and the elapsed time after each measurement cycle. The unit has a voltmeter showing the battery voltage continuously.

Sampling intervals can be selected by means of a rotary switch. In addition to 10 intervals from 0.5 to 180 minutes, the switch has positions for continuous operation (Non Stop) and remote start. In the latter case a single measurement cycle is performed on reception of a remote triggering signal. A trigger signal is also generated when setting the power switch to the Manual Start position. If a Manual or a Remote Start signal is given less than 50 seconds before the start of the preset interval, the signal is disregarded. A Manual or a Remote Start signal will also generate a time record in the Data Storage Unit.

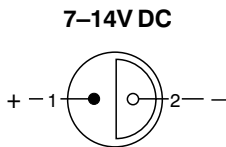
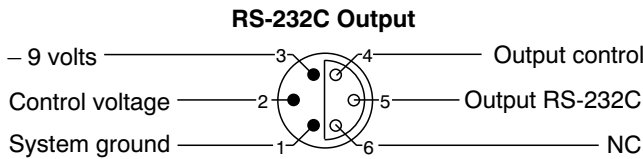
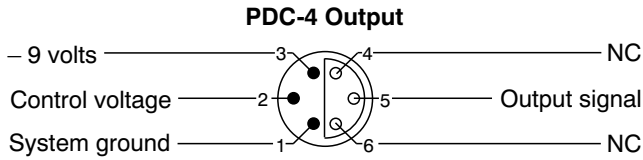
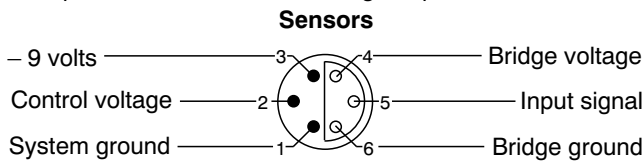
The 3010 is supplied with a reference plug in the channel 1 input receptacle. This will give a fixed reading in every measurement cycle and serve as a station identification number.

In the field the unit is normally powered by the Solar Cell Power Module 3189 or by batteries. If available it can be mains powered via the AC/DC Adapter 3786.

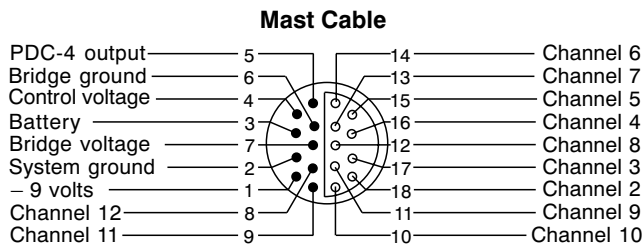
SPECIFICATIONS FOR SENSOR SCANNING UNIT 3010

PIN CONFIGURATION

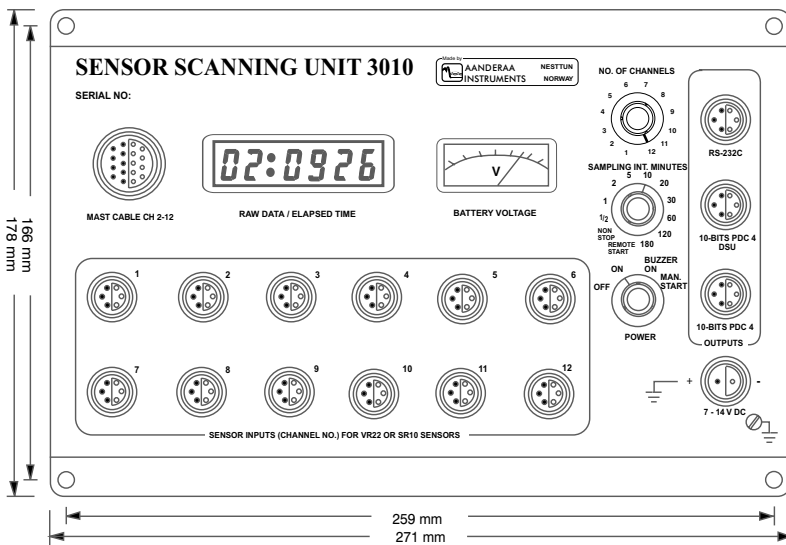
Receptacle, exterior view; bushing = ○; pin = ●



(to activate the RS-232C output, a strapping is needed between the -6V pin and the Output control pin. This strapping will normally

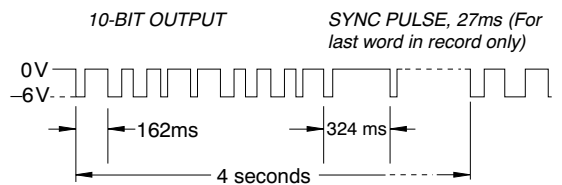


- Measuring Principle:** Successively balanced bridge
- Bridge Voltage:** 10 pulses for each channel
Duration of each pulse 1/36 second
- Input Signals:** From Aanderaa analog (VR22) or digital sensors (SR 10)
- Measuring Range:** 1/22 of bridge voltage symmetrically around bridge midpoint
- Output Signals:** a) Aanderaa 10-bit binary word, PDC-4, see timing diagram
b) RS-232C, ASCII coded decimals at 1200 baud, 8 data bits, no parity and 2 stop bits
- Resolution:** 10 bits
- Accuracy:** ±1 bit
- Operating Temperature:** -40 to +60°C
- Measuring Speed:** 4 seconds each channel
- Number of Channels:** Selectable from 1 to 12
- Sampling Intervals:** Selectable: Non-stop, 0.5, 1, 2, 5, 10, 20, 30, 60, 120 or 180 minutes
- Remote Start:** 5V positive pulse supplied to the "Output signal" pin of the PDC-4 output receptacle (control switch in position "REMOTE START ONLY")
- Supply Voltage:** 7 to 14 volt (-9 volt nominal)
- Current Drain:** 8 mA average when operating, sensor currents not included
- Quiescent Current:** Typically 100µA
- Electrical Connection:** For 18-pin receptacle: Plug 2956
For 6-pin receptacle: Plug 2828
For 2-pin receptacle: Plug 2979
- Material and Finish:** Hard anodized aluminum
- Weight:** 1.9 kg
- Warranty:** Two years against faulty materials and workmanship
- Accessories (optional):** AC/DC Adapter 3786
110-260VAC/ 12VDC, 3A



TIMING DIAGRAM PDC-4

One word of message. Output Pulses (Binary 1001100011 shown)



RS-232C ASCII FORMAT

| | | | | | | |
|----------------------------------------|---|---|---|-------|-------|----------|
| One data word 6 characters | | | | | | No synch |
| 1 | 2 | 3 | 4 | 5 | 6 | Synch |
| READING (any number from 0000 to 1023) | | | | Space | Space | No synch |
| | | | | CR | LF | Synch |

Latest version is on the Internet

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