

ARC WELDING DATA-LOGGER AND MONITORING SYSTEM

ARC LOGGER TEN (A.L.X)

The TVC Arc Logger Ten (A.L.X) is a fully programmable digital, battery powered Arc Welding Data-Logger and Monitor capable of measuring all of the main parameters in the Arc Welding Process.



Each ALX logger has an in-built printer to give an instant hard copy of the weld results. The results are also held within the units internal memory which can then be loaded to PC via the units RS232 Serial Port.

The basic ALX unit is supplied with probes to measure Arc Voltage and Welding Current. Additional options are available to measure Wire Feed Speed, Weld Head Travel Speed, Pre-Heat and Interpass Temperatures and Shielding Gas Flow.



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ARC WELDING DATA-LOGGER AND MONITORING SYSTEM

ARC LOGGER TEN (A.L.X)

The Arc Logger Ten (ALX) is a versatile weld monitor and data-logger capable of accurate, fast and efficient data acquisition of the main parameters in arc welding processes. The unit gives a permanent hardcopy printout of all the measured parameters and also logs the data in an internal memory, which can be downloaded to PC after welding.

Using the ALX is easy and simple, it uses non-intrusive probes which can be quickly and easily clamped onto all types of welding power sources and cables by the operator. The ALX is intended for use with manual, semi-automatic and fully automatic processes, namely:- Covered Electrode (MMA), Metal Inert Gas (MIG or CO₂), submerged arc (SMAW), Tungsten Inert Gas (TIG) and Plasma.

The ALX can be used single handedly by the welder, providing an independent, permanent printed record for future analysis by others or by the welder. The operator entered headings on the printout provide the central core of information to allow the weld information collected by the ALX to be included as part of a comprehensive Quality Assurance Quality Control system.

Each hard copy print-out provides the following information:

Unique s/no of ALX Unit.

Date and time printed prior to welding.

Weld procedure information programmed via PC by operator.

Auto numbering of weld run.

Parameter limits programmed via PC by operator.

Weld parameter data sampled, averaged and then printed. Print rate is programmable via PC.

Logging of temperature (optional).

Logging of flow rate (optional).

Summary of welding parameters printed on completion of weld run.

Calculation of heat input.

Calculation and print-out of parameter totals including arc energy.

Weld length inputted by the operator after completion of weld.

Confirmation of memory space.

```
TUC ARC LOGGER X
SET NO          23
DATE           1/ 1/2000
TIME           10:36:20
PROJECT        Test
JOB No         1234
PROCEDURE No  4321
WELDER         J. Bloggs
WELDER No      123
WELD No        1
ROD/WIRE       1.2
GAS TYPE       Argon
RUN NUMBER     1
HI-LO          LIMITS
199 19.9  99.9  1999  UPPER
0   0.0   0.0   0    LOWER
TRAU WIRE ARC  ARC  TIME
CM/M  M/M  VOLTS  AMPS  SECS
44   7.0  23.3  332   2.7s
48   7.0  23.3  332   4.7s
48   7.0  23.4  331   6.1s
ARC TIME      6.1s
TEMP.         299 DegC
GAS FLOW      22 L/MIN
SUMMARY
48   7.0  23.4  332   MAX
47   7.0  23.3  332   AVE
44   7.0  23.3  331   MIN
HEAT INPUT    979 J/MM
TOTALS
WIRE CONSUMED 8.6 M
CALC. ENERGY 47 KJ
ARC TIME      6.1s
WELD LENGTH   48 mm
GAS CONSUMED  2.2 l
MEM UNUSED    29568 BYTES
```

The printed information is comprehensive but with the provision of on-board data storage as standard, the ALX allows the user the additional option of down-loading the collected weld data to a PC for further processing or incorporation into a weld database/archive/spreadsheet.



Two such spreadsheets which have been designed for use with the ALX are supplied with the ALX Arclog software. The first spreadsheet (fig.1) is a weld procedure qualification log which details the procedure data together with the welding parameters.

fig.1		ALX WELDING PROCEDURE QUALIFICATION RECORD MONITOR SHEET														
T.V.C.		Project : Test				Job No : 1234										
		Procedure No : 4321				Date : 1-Jan-00										
WELD PARAMETERS																
Weld No.	Run No.	Weld Time	Welder	Weld Process	Consumables Elec/Wire Diam (mm)	Pol	Gas Type	Flow Rate (L/Min)	Interpass Temp (Deg C)	Volts	Amps	ROL (mm)	Time (sec)	Welding Speed (mm/sec)	Wire Feed Speed (mm/min)	Heat Input (J/mm)
1	1	1300	Jim	Tig	1.20	+	Ar	18	250	16.1	65	90	92.0	0.9	0.0	1096

Importation of the welding data is controlled via the ALX Arclog software which links directly to the MS EXCEL spreadsheet. Integration of the weld data is automatic, the operator only needs to type in the weld process and polarity.

The second spreadsheet (fig.2) is a weld parameter log and weld costing spreadsheet, giving the operator fast and efficient welding costs with minimal operator input. As with the first spreadsheet importation and integration of the weld data is controlled via the ALX Arclog software.

TVC ALX WELD DATA SPREADSHEET																
Proc. No.		Project														
1234		Weld Test														
WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO	WELD NO
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER	WELDER
Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price	Jan Price
01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00	01-Jan-00
09:55	10:05	10:20	10:35	10:55	11:25	12:05	14:25	14:55	15:52	15:52	15:52	15:52	15:52	15:52	15:52	15:52
149	151	148	149	155	149	151	149	151	155	155	155	155	155	155	155	155
23.9	22.9	23.4	23.3	22.7	23.9	22.9	22.9	22.9	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
5.9	4.0	5.8	5.8	4.1	5.9	4.0	5.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
12.0	12.1	12.2	12.2	11.9	12.8	12.1	12.2	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
54.0	52.8	51.0	51.8	57.8	54.8	52.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8	51.8
708	706	704	704	715	708	706	704	704	704	704	704	704	704	704	704	704
145	143	147	146	155	148	143	147	143	143	143	143	143	143	143	143	143
1714	1715	1703	1707	1774	1714	1715	1707	1707	1707	1707	1707	1707	1707	1707	1707	1707
21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
18.9	18.5	17.9	18.1	20.2	18.9	18.5	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
5.1	5.1	4.9	4.9	5.0	5.9	5.1	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
09:56	10:07	10:22	10:36	11:26	12:06	14:08	14:36	15:14	15:53	15:53	15:53	15:53	15:53	15:53	15:53	15:53
65.1	72.2	64.5	66.2	62.4	65.1	72.2	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5
GAS USED (Cu.M)	0.0195		0.0184		0.0175		0.0187		0.0202		0.0199		0.0194		0.0195	
GAS NAME	ARGON		ARGON		ARGON		ARGON		ARGON		ARGON		ARGON		ARGON	
GAS COST Pcu.M	1.96		1.96		1.96		1.96		1.96		1.96		1.96		1.96	
TOTAL GAS COST	0.04		0.04		0.03		0.04		0.04		0.04		0.04		0.04	
WIRE TYPE	TIG		TIG		TIG		TIG		TIG		TIG		TIG		TIG	
WIRE DIAM. (mm)	1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2	
WIRE USED (kg)	0.024		0.021		0.021		0.022		0.024		0.024		0.024		0.024	
WIRE COST (£)	15		15		15		15		15		15		15		15	
WIRE TOTAL COST	0.562		0.500		0.467		0.476		0.476		0.476		0.476		0.476	
POWER COST KW.H	0.87		0.87		0.87		0.87		0.87		0.87		0.87		0.87	
POWER USED (KW.H)	2.78		2.69		2.59		2.59		2.59		2.59		2.59		2.59	
TOTAL POWER COST	0.19		0.19		0.18		0.18		0.18		0.18		0.18		0.18	
LABOUR COST £/H	18.80		18.80		18.80		18.80		18.80		18.80		18.80		18.80	
LABOUR COST (SET UP)	0.26		0.10		0.07		0.07		0.07		0.07		0.07		0.07	
LABOUR COST (WELD)	0.27		0.26		0.26		0.26		0.26		0.26		0.26		0.26	
TOTAL OVERALL COST	1.96		1.90		1.90		1.92		1.92		1.92		1.92		1.92	

The spreadsheet performs the required calculations to convert the wire used into kg and gas used into cubic metres. The operator only has to input the gas name, the wire type and wire diameter.

Once the data is inputted the spreadsheet uses an onboard database of gas costs, wire costs, labour and power costs to calculate an overall weld cost. Custom spreadsheets can be designed and programmed to work with the ALX and the Arclog software.

The Arclog software is available for use with desktop or laptop PCs running MS Windows 95/98 or NT. Versions for both MS Windows CE V2.11 and Psion 3/5 are available.

The ALX offers many benefits to its users - it can be used to develop and improve welding procedures and, when used during the setting up of welding conditions, it helps eliminate time consuming trials and error and reduces costly rejects or repairs. In process monitoring allows rapid and reliable diagnosis of intermittent equipment malfunctions and process deviations which in turn may indicate equipment deterioration allowing preventative maintenance to be quickly and efficiently applied to avoid expensive 'down-time' and lost production. The ALX may also be used for the training and qualification of welders and validation of power sources.

Whether the ALX is used in the QA/QC department, training school or the production department it has many benefits, including:

- Better quality control (can help achieve ISO 9000)
- More definable weld integrity
- Improved cost effectiveness of production welding.

All ALX units are supplied fully calibrated with certification traceable to National Standards.

ALX Technical Specification

GENERAL UNIT

Applications:	MMA/MIG/TIG(AC/DC) Subarc/Fluxcore
Size (mm):	206 x 206 x 308
Battery:	Sealed Lead-Acid (Re-Chargeable)
Temperature Range:	0-40°C
Techniques:	Manual/Semi or Fully - Automatic/Robotic
Weight:	7kg (Excluding probes and charger)
Battery Charger:	External 220/240vac - 8hr Re-Charge
Printer:/ Rate:	32 character dot-matrix - 2s/30s/user selected

MONITORED PARAMETERS

PARAMETER	ACCURACY
Average Current:	15-1999A $\pm 2\%$ FSD
Average Voltage:	0-99.9V $\pm 1\%$ FSD
Arc Energy:	1-9999kJ $\pm 2\%$ FSD
Arc Time:	0.3-9999Secs. $\pm 0.1\%$
Heat Input:	1-9999J/mm $\pm 2\%$ FSD
Wire Speed:	0-20.0m/min $\pm 2.5\%$ FSD
Wire Consumed:	0-999m $\pm 2.5\%$ FSD
Traverse Speed:	0-999cm/min $\pm 1.0\%$ FSD
Temperature:	0-1000°C $\pm 1\%$ of Rdg
Gas Flow:	0-120Lt/min $\pm 5.0\%$ FSD

TVC reserve the right to change product specification without prior notice.



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