Tubing Ovality Monitor

TOM

User Manual

Courtenay House, Monument Way East, Woking, Surrey GU21 5LY, U.K.
Tel: +44-844 443 7925 Fax: +44-844 443 7928
Email: support@medcotas.com
Home Page: http://www.medcotas.com

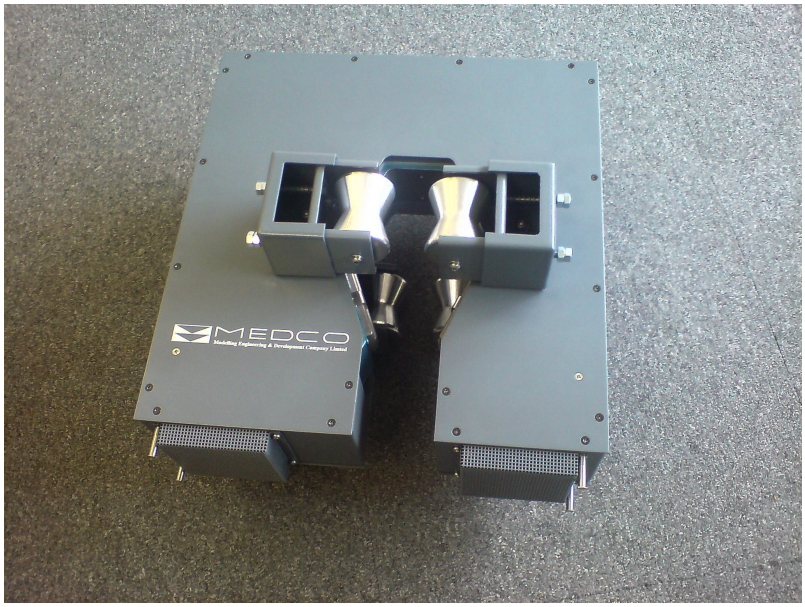
Tubing Ovality Monitor - *TOM*

Tubing Ovality Monitor is a system to measure coiled tubing string ovality.

- Diameter sizes from 1” to 2”.
- Very high scan rate (measuring frequency).
- Highly precise measurements.

Laser measuring head

This is the measuring sensor device. The laser measuring head has laser transmitters and receivers. For as long as the pipe remains within an area of 64 x 64 mm squared, the laser measuring head will measure the pipe ovality accurately and is programmed to make 10 readings per second. Thus even at coiled tubing speeds of 120 ft/min, the device will measure the ovality 5 times per foot.



Laser measuring head

The laser measuring head requires 230 VAC to operate and transmits data to the *controller HMI* through a serial port (*RS-232*).

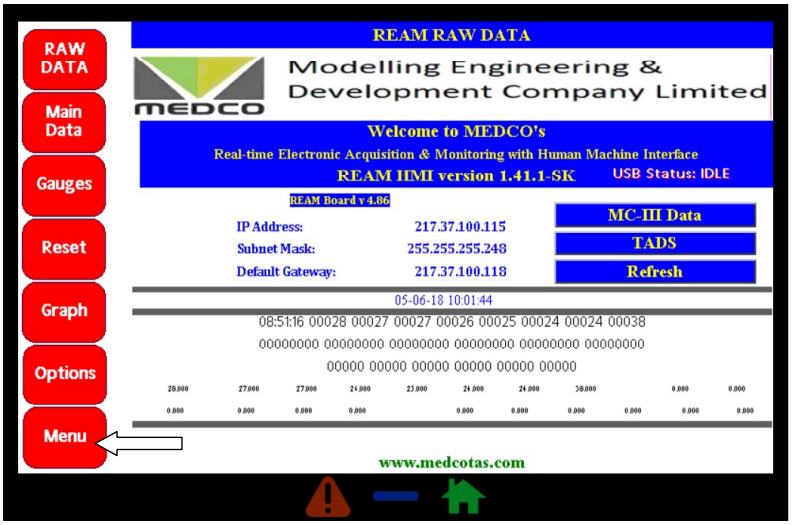
Furthermore, in extreme weather conditions it is necessary to keep the laser device at a reasonable operating temperature. The optimum temperature range is between 0^{o}C to 45^{o}C. Thus, the laser measuring head is equipped with a climate control, which will self-start once the conditions approach uncomfortable. The climate control utilises 12 vdc power and can be supplied directly from a truck battery. The current drawn by the climate control system would be around 15 amps.

Controller

The communication between the controller HMI and the laser measuring head is through a serial port (*RS-232*). On the HMI, the port used is Port B.

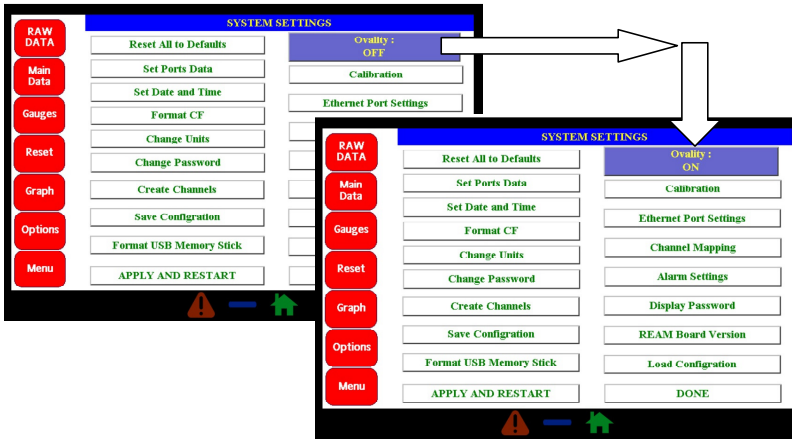
The controller HMI saves the *Depth*, *Ovality*, *Ballooning, Necking, Maximum Diameter*, and *Minimum Diameter* data every 1 second.

To enable the HMI read data from TOM, the OVALITY option must be turned on. This option is accessed through the HMI MENU;

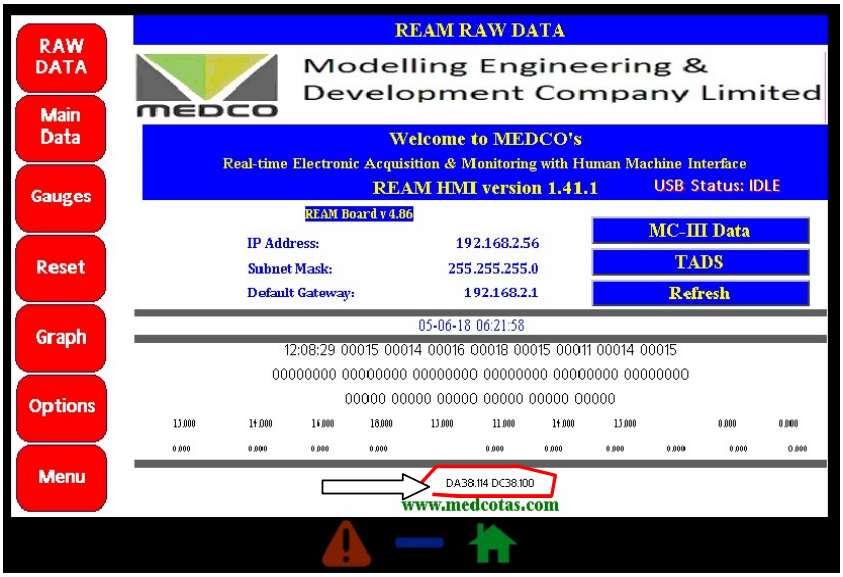


After entering the password[1] the HMI Systems Settings screen will be displayed.

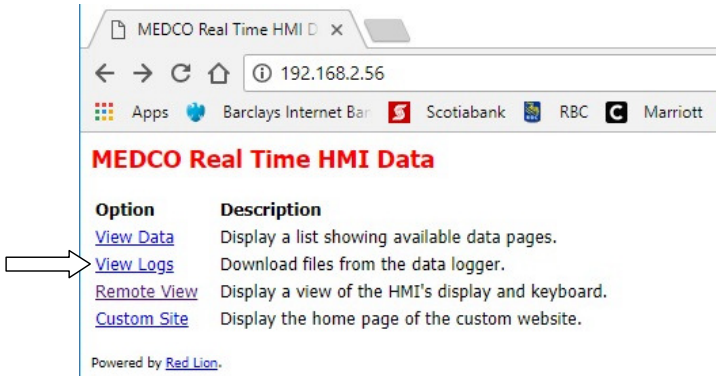
[1] *By default, the password is 290992*

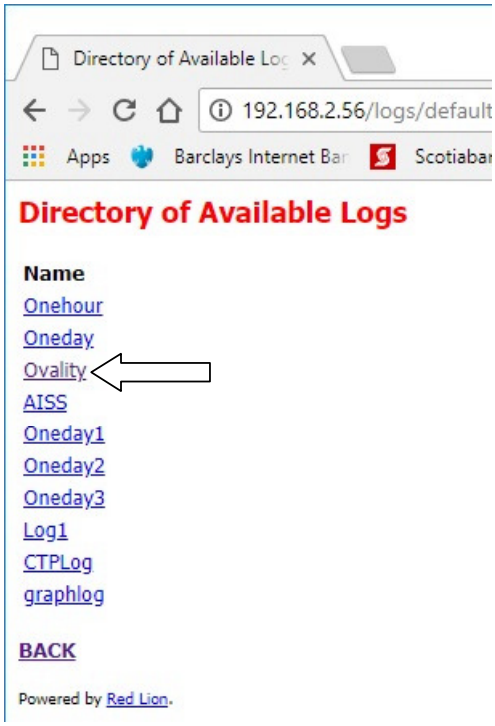


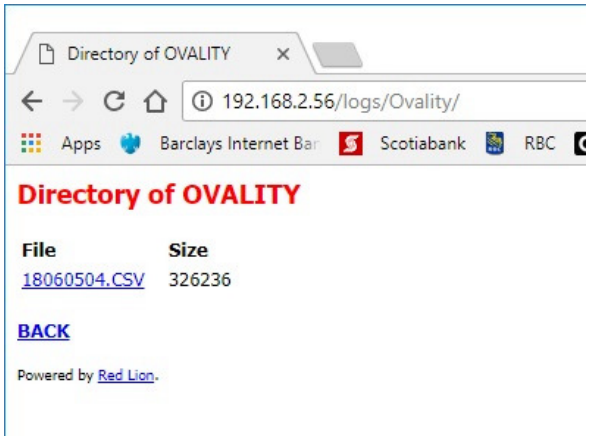
After turning the OVALITY function ON, the Raw Data from TOP can be viewed on the RAW DATA page.

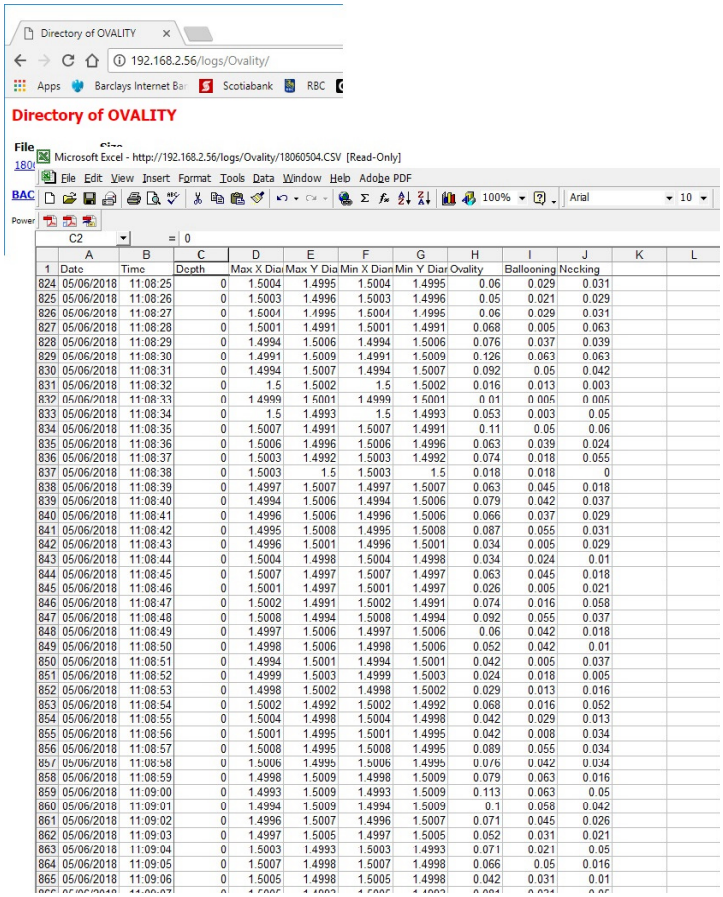


Finally, all the Ovality data will be recorded in a CSV file on the SD memory card. The stored data can be viewed from the home page of the HMI and clicking View Logs.







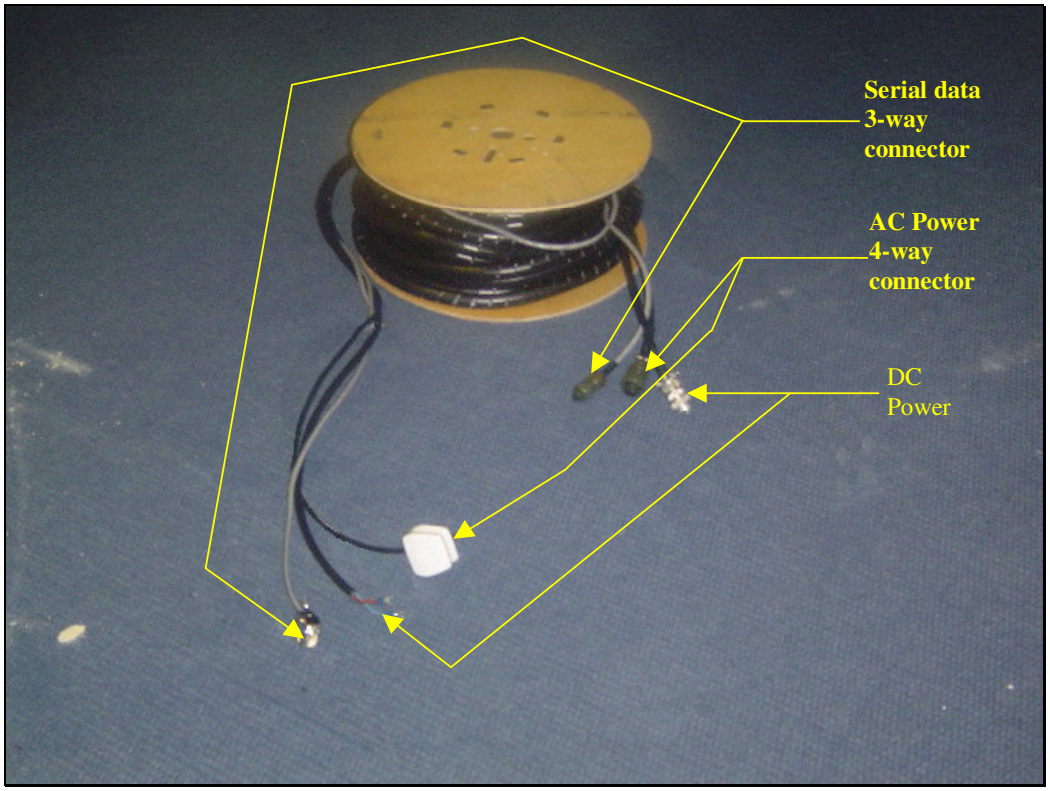


	A	B	C	D	E	F	G	H	I	J	K	L
1	Date	Time	Depth	Max X Dia	Max Y Dia	Min X Dian	Min Y Diar	Ovality	Ballooning	Necking		
824	05/06/2018	11:08:25	0	1.5004	1.4995	1.5004	1.4995	0.06	0.029	0.031		
825	05/06/2018	11:08:26	0	1.5003	1.4996	1.5003	1.4996	0.05	0.021	0.029		
826	05/06/2018	11:08:27	0	1.5004	1.4996	1.5004	1.4996	0.06	0.029	0.031		
827	05/06/2018	11:08:28	0	1.5001	1.4991	1.5001	1.4991	0.068	0.005	0.063		
828	05/06/2018	11:08:29	0	1.4994	1.5006	1.4994	1.5006	0.076	0.037	0.039		
829	05/06/2018	11:08:30	0	1.4991	1.5009	1.4991	1.5009	0.126	0.063	0.063		
830	05/06/2018	11:08:31	0	1.4994	1.5007	1.4994	1.5007	0.092	0.05	0.042		
831	05/06/2018	11:08:32	0	1.5	1.5002	1.5	1.5002	0.016	0.013	0.003		
832	05/06/2018	11:08:33	0	1.4999	1.5001	1.4999	1.5001	0.01	0.005	0.005		
833	05/06/2018	11:08:34	0	1.5	1.4993	1.5	1.4993	0.053	0.003	0.05		
834	05/06/2018	11:08:35	0	1.5007	1.4991	1.5007	1.4991	0.11	0.05	0.06		
835	05/06/2018	11:08:36	0	1.5006	1.4996	1.5006	1.4996	0.063	0.039	0.024		
836	05/06/2018	11:08:37	0	1.5003	1.4992	1.5003	1.4992	0.074	0.018	0.055		
837	05/06/2018	11:08:38	0	1.5003	1.5	1.5003	1.5	0.018	0.018	0		
838	05/06/2018	11:08:39	0	1.4997	1.5007	1.4997	1.5007	0.063	0.045	0.018		
839	05/06/2018	11:08:40	0	1.4994	1.5006	1.4994	1.5006	0.079	0.042	0.037		
840	05/06/2018	11:08:41	0	1.4996	1.5006	1.4996	1.5006	0.066	0.037	0.029		
841	05/06/2018	11:08:42	0	1.4995	1.5008	1.4995	1.5008	0.087	0.055	0.031		
842	05/06/2018	11:08:43	0	1.4996	1.5001	1.4996	1.5001	0.034	0.005	0.029		
843	05/06/2018	11:08:44	0	1.5004	1.4998	1.5004	1.4998	0.034	0.024	0.01		
844	05/06/2018	11:08:45	0	1.5007	1.4997	1.5007	1.4997	0.063	0.045	0.018		
845	05/06/2018	11:08:46	0	1.5001	1.4997	1.5001	1.4997	0.026	0.005	0.021		
846	05/06/2018	11:08:47	0	1.5002	1.4991	1.5002	1.4991	0.074	0.016	0.058		
847	05/06/2018	11:08:48	0	1.5008	1.4994	1.5008	1.4994	0.092	0.055	0.037		
848	05/06/2018	11:08:49	0	1.4997	1.5006	1.4997	1.5006	0.06	0.042	0.018		
849	05/06/2018	11:08:50	0	1.4998	1.5006	1.4998	1.5006	0.052	0.042	0.01		
850	05/06/2018	11:08:51	0	1.4994	1.5001	1.4994	1.5001	0.042	0.005	0.037		
851	05/06/2018	11:08:52	0	1.4999	1.5003	1.4999	1.5003	0.024	0.018	0.005		
852	05/06/2018	11:08:53	0	1.4998	1.5002	1.4998	1.5002	0.029	0.013	0.016		
853	05/06/2018	11:08:54	0	1.5002	1.4992	1.5002	1.4992	0.068	0.016	0.052		
854	05/06/2018	11:08:55	0	1.5004	1.4998	1.5004	1.4998	0.042	0.029	0.013		
855	05/06/2018	11:08:56	0	1.5001	1.4995	1.5001	1.4995	0.042	0.008	0.034		
856	05/06/2018	11:08:57	0	1.5008	1.4995	1.5008	1.4995	0.089	0.055	0.034		
857	05/06/2018	11:08:58	0	1.5006	1.4995	1.5006	1.4995	0.076	0.042	0.034		
858	05/06/2018	11:08:59	0	1.4998	1.5009	1.4998	1.5009	0.079	0.063	0.016		
859	05/06/2018	11:09:00	0	1.4993	1.5009	1.4993	1.5009	0.113	0.063	0.05		
860	05/06/2018	11:09:01	0	1.4994	1.5009	1.4994	1.5009	0.1	0.058	0.042		
861	05/06/2018	11:09:02	0	1.4996	1.5007	1.4996	1.5007	0.071	0.045	0.026		
862	05/06/2018	11:09:03	0	1.4997	1.5005	1.4997	1.5005	0.052	0.031	0.021		
863	05/06/2018	11:09:04	0	1.5003	1.4993	1.5003	1.4993	0.071	0.021	0.05		
864	05/06/2018	11:09:05	0	1.5007	1.4998	1.5007	1.4998	0.066	0.05	0.016		
865	05/06/2018	11:09:06	0	1.5005	1.4998	1.5005	1.4998	0.042	0.031	0.01		

Cables Bundle

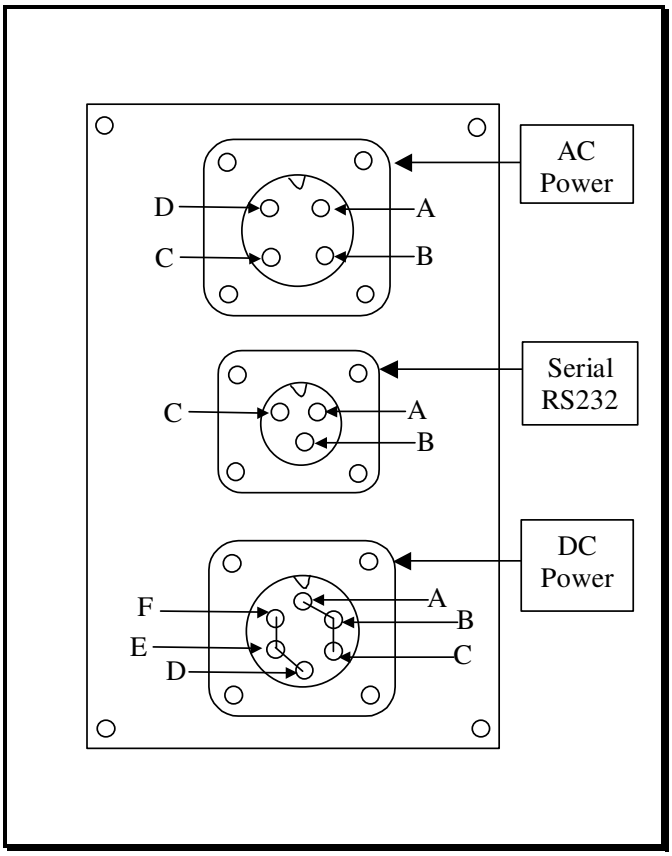
A cable bundle consisting of four individual cables is supplied with the unit. Each cable is used for a specific task:

1. **Serial data cable**: This cable is used for connecting between the serial port on the *control HMI* to *the laser measuring head*.
2. **AC Power**: This cable is used to supply the *laser measuring head* with AC power. Plugs directly to a power socket.
3. **DC Power**: This cable is used to supply DC power to the *climate control* system within the *laser measuring head*. Can be connected directly to a truck battery, hence the connections to the battery are loose.



Cables bundle

Connections



Front view of chassis mount connectors
On the side of the Laser Measuring Head

AC Power – 4 way connector
A = Live
B = Neutral
C = Ground
D = Not connected

Serial RS232 – 3 way connector

TOM Connector	D-Type Connector	RJ11 Connector
Pin A	Pin 2	Yellow
Pin B	Pin 3	Black
Pin C	Pin 5	Red

Important Note: If using a 3-pin connector on the REAM HMI enclosure or flightcase, then ensure that you the TOM connector to RJ11 convention. If the REAM HMI connector is XLR type, then use Pin 1 instead of Pin A, Pin 2 instead of Pin B, and Pin 3 instead of Pin C.

DC Power – 6 way connector
A = +12 vdc
D = Ground or 0 vdc
Short A, B, and C on both 6-way connectors, i.e. on the chassis mount male and cable mount female
Short D, E, and F on both 6-way connectors, i.e. on the chassis mount male and cable mount female.