

# MOWDEN CONTROLS LTD NORTHALLERTON, UK

### **TECHNICAL SPECIFICATION**

#### BATTERY POWERED TEMPERATURE LOGGERS FOR USE WITH WORTHINGTON DRY SHIPPERS

REV	DATE	EQMS /F21	REVISION DETAILS	BY	CHKD	APPD
А	02/03		First Issued	GHL	NM	NM
В	04/03		Updated for first prototypes	GHL	NM	NM
С	09/03		Revised for extra memory and DO160D approval.	GHL	NM	NM
1	01/04		First production of M380CE variant	GHL	NM	NM
2	02/04	F21/1450	M385CE added	GHL	NM	NM
3	01/05	F76/1093 F21/1594	Temperature alarm feature added.	GHL	NM	NM
4	12/06	F21/1735	. Tip over switch added to M38x loggers.	GHL	NM	NM
5	02/15	F21/2638	. TW logo removed from images. M382 photo added.	GHL	RA	RA
6	11/18	11320	Memory size increase to 16K records.	GHL	AS	NM

#### **REVISION STATUS**

#### 1. Introduction

This specification has been developed in response to the requirement for a Data Logger for monitoring of the storage temperature of biological materials while in transit. The main intended use is with Worthington Dry Shippers Other variants are possible to suit different applications. These will be covered by product specific information in future issues of this specification.

#### 2. Key features

Logging and non-volatile storage of 16000+ temperature measurements (Previously 8K records maximum – See section 4.5)

Logging intervals adjustable from 1 minute to 30 minutes

Battery operation (Non rechargeable Lithium cell). Typically greater than 5 years life.

PC Interface.

Product specific software for setting up, status checking, and downloading of data.

Data output as tables in PDF format or as Excel spreadsheet with temperature graph.

Status indication by LED (Logging Active/Standby and Battery condition).

Alarm indication by LED if temperature rises above a preset limit. Limit may be set using PC software.

For m38x-T variants (with tilt switch):-

Alarm indication by LED if container is transported in a non-vertical position.. Time limit (to allow for normal handling procedures) may be set using PC software.

Measuring range -199 °C to +40 °C,

Accuracy +/- 3 °C.

### 3. Accessories

PC Cable (9 pin serial or USB) + Software (Supplied Separately)

### 4. Product specific details

# 4.1 M380CE and M380CE-T Temperature Loggers for CP100 and CX100 Dry Shippers

The electronics are housed in a modified neck plug (Figs 1a and 1b). The height of the plug cap is increased by 4mm approx.

The Sensor plate reduces the available headroom in the container by 15mm approx. The plate is approximately level with the top of the canister when fully inserted.

The PC Interface connector and LED indicator are accessible from the top of the plug cap (Fig 1b).

Operating temperature -20 °C to +50 °C

Environmental protection to IP64

Compliance with RTCA DO160D Section 21.4 Cat B (RF Emissions). Safe for air transport.

-T variant has Tilt switch. (See 4.4).



Fig 1a M380CE Temperature Logger



Fig 1b Top view – M380CE installed in a CX100 Dry Shipper.

Note: Reduction in 'Holding' time

Due to extra heat leakage caused by the thermocouple and electronics the holding time will be reduced slightly. Users should be aware of this if using the container for extended periods.

# 4.2 M385CE and M385CE-T Temperature Loggers for CP500 and CX500 Dry Shippers

The electronics are housed in a modified neck plug (Fig 2a). The height of the lid is increased by 4mm approx.

The Sensor plate projects from the bottom of the neck plug by 15mm approx (Fig 2b).

Specifications are the same as for the M380CE (4.1) See also note on 'Holding Time'.



Fig 2a – M385CE-T Temperature Logger



Fig 2b M385CE - Sensor Plate Position

## 4.3 M382CE and M382CE-T Temperature Loggers for CXR100 Dry Shippers

Specification is similar to the M380 but is housed in the CXR100 neck plug with a metal lid.



### 4.4 M38xCE-T – Loggers with Tilt Switch

From January 2007 the M38x range of temperature loggers were fitted with a tilt switch. This can be used to monitor the position of the container during transit. If the container and logger are tipped from the vertical by more than 60 degrees (+/- 10 degrees) the switch operates. This is recorded in the log.

There is also a timer which can be set between 1 minute and 4 hours. The timer counts down while the logger is tilted and stops when the container is upright. A second LED indicates an alarm if the timer counts down to zero.

The alarm is also indicated in the log and there is a status indicator in the PC Software. The timer avoids nuisance alarms caused my normal handling. PC Software V1.6. or later is required to enable and program the tilt alarm. See pictures below:-

	ent Time (PC) = 16:39:35 Date = 15/11/2018	
File Logger Help		
Status M380 Temperature Logger Logger Address 01 ID No. 800999 Temperature 20° C Time - 16:38 Date - 15/11/24 Tilt - Tilted Set Clock To PC Clock Connection	Logging Logging Status = ACTIVE Log Interval - 1 min Set Log Interval 1 • min Start Condition - None Set Start Condition to None • 100 * C Stop Condition - None Set Stop Condition to None •	Data       Temp Alarm       Tilt Alarm       Calibration         Tilt Alarm Status - Disabled         Set Tilt Alarm Status to         Disabled         Set Tilt Alarm Timer to         Apply    Alarms Temperature Alarm - N/A Tilt Alarm - N/A
Log Dutput	Stop Logging	Reset Reset

Tilt Alarm Status - Disabl	led
Set Tilt Alarm Status to	
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Set Tilt Alarm Timer to	🔹 hrs 📋 🌲 mins
App	19
App	<u>19</u>
	19.
App larms Teraperature Alam	No Tilt Alarm

Controls to enable Tilt switch and to program timer

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Ter	mperat	ture Log	ger No.0	1, Ident	No.999999												
08.	/01/20	007	09:13:08	1													
Log	No. Dat	te And Time	Temperature	Status	Position												
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Switch position indicated in spreadsheet and on graph.

### 4.5 M38xCE-T – Loggers with 16K memory.

Units from the following serial no.s onwards have the 16K memory :-

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M380/0291
M382/0082
M385/0445
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This can be seen as 'Maximum Number of Records' if the Data tab is opened on the main status screen.

24.2	Temp Alarm	Tilt Alarm	Calibration
Num	ber Of Stored	Records - 2	90
1.000	ords To Down		
Maxi	imum Number	Of Records	- 16384
	Clear	Restore	Delete
T T	emperature Lo	g Sp	oread Sheet