



**FEDERATION
EUROPEENNE DE LA
MANUTENTION**
**Product Group Cranes
and Lifting Equipment**

FEM
5.018
Edition 1
13.03.2013

Event Recorder - Specifications
- Mobile Cranes according to EN13000 -

Event Recorder - Spezifikationen
- Mobilkrane nach EN13000 -

**Enregistrement du Contrôleur d'État de Charge -
Spécifications**
- Grues Mobiles selon la norme EN13000 -

Fédération Européenne de la Manutention - Product Group Cranes and Lifting Equipment

Copyright: FEM PG CLE

Available in English (E)

Sources see end of the document

CONTENT

1	INTRODUCTION.....	3
2	SCOPE.....	3
3	DEFINITIONS.....	3
4	REQUIREMENTS AND PROPERTIES OF AN EVENT RECORDER	4

1 INTRODUCTION

The main goal of this document is to provide design rules and information on an Event Recorder installed on Mobile Cranes according to EN13000:2010; This includes definition of the Event Recorder function as well as on the minimum data to be recorded in this recording device. A standardized minimum content of the event recorded on the crane is important towards authorities in charge of incident investigation.

These requirements reflect also a consistent industry approach on the Event Recorder functionalities.

2 SCOPE

This document applies to mobile cranes and is considered as a complementary rule to EN13000:2010, chapter 4.2.6.3.3 b).

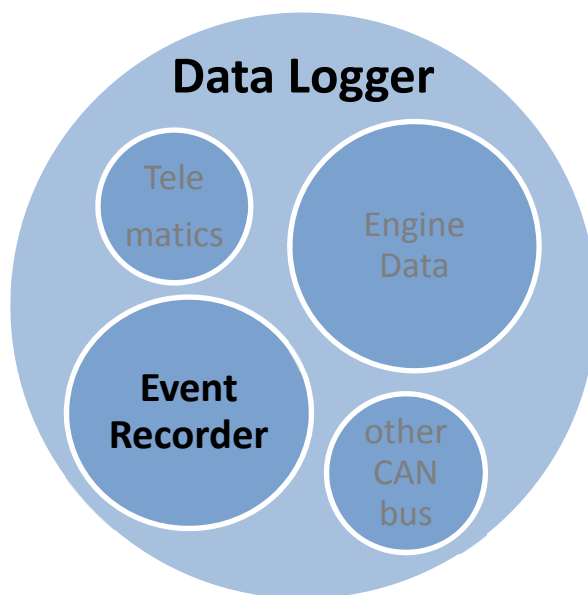
3 DEFINITIONS

Event recorder (subject to this document):

An event recorder monitors and records load-related data and geometric information when occurrences trigger the system, such as errors, bypasses, overloads, and configuration changes. The event recorder is capable of storing a certain amount of data in a memory system. Once the memory fills, the system begins recording over old data (oldest to newest); whereas the number of overloading events may be counted together with the classified percentage of overloading.

Data logger (for comparison purpose only):

This is a device that can record any data e.g. geometric information, engine data, fuel consumption. The data logger may include the data of events as recorded in the Event Recorder. The data logger is typically capable of storing a certain amount of data in a memory system.



4 REQUIREMENTS AND PROPERTIES OF AN EVENT RECORDER

An event recorder as foreseen in EN13000:2010 shall comply with following requirements:

4.1. Content

The following load-related data shall be recorded to enable accident investigation and/or reconstruction.

The minimum amount of different data written in the event recorder when the crane is overloaded (event triggered recording necessary for accident investigation) has been identified by FEM as:

- date and time
- crane configuration
- permitted load, actual load, percentage of usage of rated capacity
- radius of load
- total boom length
- sequence of extension for telescopic cranes
- main boom angle, luffing jib angle (if operated with luffer)

4.2. Trigger conditions

As a minimum, the following conditions shall trigger the recording of the above described parameters:

- activation of the RCL override key
- activation of the luffing up override key in overload condition
- activation of the override key of the hoist limiter (anti two block)
- activation of the set up button
- activation of cut-off switch when load reaches or exceeds 100% of the Rated capacity

Furthermore, it is recommended to record any change of configuration

Table: Example of Event Recorder data content

Read out of the Event Recorder - SI (values)					
			Type: _____ Crane No: _____		
Parameter	Unit	Format	Example figures		
			values 1	values 2	values x
date	BCD	[yy-mm-dd]	08-03-13	14-03-08	...
time	BCD	[hh:mm:ss]	18:40:08	08:40:08	...
rigging mode	dezimal	[99999]	01404	01404	...
max. load	[1/10t]	[9999,9]	31,4	40,0	...
actual load	[1/10t]	[9999,9]	29,2	29,2	...
percentage	[%]	[999]	94	94	...
Radius	[1/100m]	[999,99]	30,20	30,00	...
boom length	[1/100m]	[999,99]	47,34	47,34	...
length Tele 1	[%]	[999]	92	92	...
length Tele 2	[%]	[999]	92	92	...
length Tele 3	[%]	[999]	92	92	...
length Tele 4	[%]	[999]	0	0	...
length Tele 5	[%]	[999]	0	0	...
length Tele 6	[%]	[999]	0	0	...
boom angle	[1/10°]	[999,9]	82,6	82,6	...
fly jib angle (luffing or	[1/10°]	[999,9]	70,8	70,8	...
Set-up Button	[b]	[1]	0	0	...
Hoist limiter bridged	[b]	[1]	0	0	...
Luffing up bridged	[b]	[1]	0	0	...
Bridging Device RCL	[b]	[1]	0	0	...
...

4.3. Data ownership

The data of the events belong to the owner of the crane; he might involve the manufacturer for further analysis.

4.4. Minimum data saving/retention period

The data of the events for accident investigation (see above) shall be recorded for a limited period of minimum 3 days and may be automatically overwritten. The number of overloading events may be counted together with the classified percentage of overloading.

Note: As mobile cranes are designed for a limited number of load cycles in accordance with the classification of ISO 4301 the data may support accident investigation/reconstruction.

4.5. Condition Monitoring

The amount of data recorded in event recorders does not allow the direct assessment of worn out overloaded components or stressed areas of the structure per each incident. The event recorder does not allow condition monitoring!

4.6. Inspections

The event recorder is not substituting the regular (periodic) inspection as required by national law/requirements and/or manufacturer's instructions.

The records of periodic inspections contain data and information which for technical reasons cannot be recorded by event recorders; this additional information is nevertheless necessary for a full evaluation of the crane condition. Especially unusual occurrences during crane use need to be recorded by the user/owner (e.g. malfunctions, damages, repairs, unforeseen climatic influences). Some guidance for monitoring of cranes is given in ISO 12482-1¹ "Cranes – Condition Monitoring".

The final decision on fitness for further purpose can only be based on thorough examinations carried out by experts (i.e. visual inspection, magnetic particle, etc.).

¹ ISO 12482-1 „Cranes – Condition Monitoring“ establishes amongst others requirements and recommendation duties of user/owner related to inspection and maintenance which are:

- keep records of crane use, inspections and maintenance including unusual occurrences (e.g. unexpected loads from operational error, extreme climatic conditions), breakdowns, repairs and modifications,
- carry out thorough examination (special assessment) at appropriate time,
- carry out overhaul arising from results of examinations before further use,
- when records are not available or kept an inspection according ISO 9927-1 shall be made, any requirements as result shall be carried out before further usage of the crane.
- carry out thorough examination (special assessment) at appropriate time,
- carry out overhaul arising from results of examinations before further use,
- when records are not available or kept an inspection according ISO 9927-1 shall be made, any requirements as result shall be carried out before further usage of the crane.

References

Established by the Technical Committee of Product Group Cranes and Lifting Equipment of the Fédération Européenne de la Manutention (FEM)

Secretariat: **Secretariat of FEM Product Group Cranes and Lifting Equipment**
c/o VDMA
Materials Handling and Logistic Technology Association
Lyoner Str. 18
D-60528 Frankfurt

Available from web server of FEM (Publishing House): <http://fem.vdma-verlag.de>

FEM Member Associations:

Belgium, AGORIA

Finland, Technology Industries of Finland

France, CISMA

Germany, VDMA

Italy, AISEM

Luxembourg, Industrie Luxembourgeois de la Technologie du Métalp. a. FEDIL

Netherlands, ME-CWM

Portugal, ANEMM

Spain, FEM-AEM - E.T.S.E.I.B

Switzerland, SWISSMEM

Sweden, TEKNIKFÖRETAGEN

Turkey, ISDER

United Kingdom, BMHF

For more information regarding FEM, please visit the FEM Website:

<http://www.fem-eur.com>