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# TECHNICAL REPORT

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**On-line analyser systems – Guide to design and installation**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### ON-LINE ANALYSER SYSTEMS – GUIDE TO DESIGN AND INSTALLATION

#### FOREWORD

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IEC 61831, which is a technical report, has been prepared by subcommittee 65B: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

With the kind permission of the Engineering Equipment and Materials Users Association this report is based on and includes extracts from EEMUA Publication 138.

This second edition cancels and replaces the first edition published in 1999. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below.

- Updated references;

- Made consistent with current practices and regulations;
- Incorporating new technologies where applicable.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
65B/744/DTR	65B/793/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

This Technical Report provides guidance on the design and installation of on-line analyser systems. There are many International standards and documents which are referenced below relating to specific parts of the design and safety of on-line analyser systems. However, there is limited practical guidance available on the overall design concepts, approaches, tools and methodology for the design and installation of on-line analyser systems to ensure they perform with the required reliability and precision which this publication addresses.

The document is divided into eight clauses

1. General
2. Normative references
3. Terms and definitions
4. Remarks and considerations
5. Health, safety and environmental considerations
6. Housings
7. Sampling systems
8. Analyser communications

Individual users of on-line analysers have varying practices but the fundamental approach is generally similar. It is therefore hoped that this document will encourage standardisation within industry and lead to reduction in design and construction costs and to improved safety.

The word "analyser" has been used throughout this document to refer to instruments variously known as on-line analysers, process stream analysers, quality analysers, quality measuring instruments and process quality monitors.

Where reference is made to International standards it should be noted that National authorities may have statutory requirements that are mandatory.

## ON-LINE ANALYSER SYSTEMS – GUIDE TO DESIGN AND INSTALLATION

### 1 Scope

This technical report is a guide applicable to on-line analyser systems. It provides the necessary guidance for the system supplier and user to specify or design a complete analyser system from sample point in the process to the final output for display or control purposes.

### 2 Normative references

IEC 61285:2004, *Industrial-process control – Safety of analyzer houses*

ISO/IEC 8802-3:2000, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

BS 5925:1991, *Code of practice for ventilation principles and designing for natural ventilation*

API (ANSI/ASTM D4177), *Manual of Petroleum Measurement Standards – Part 8: Chapter 8.2 Automatic Sampling of Petroleum Products ()*

EEMUA 175, *Code of Practice for Calibration and Checking Process Analysers (Formerly IP 340)*