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Australian Standard®

Telecontrol equipment and systems

Part 5.1: Transmission protocols—Transmission frame formats

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PREFACE

This Standard was prepared by the Standards Australia Committee IT/24, Supervisory Control and Data Acquisition.

The Standard is identical with and has been reproduced from IEC 60870-5-1:1990, *Telecontrol equipment and systems*, Part 5: *Transmission protocols*, Section One—*Transmission frame formats*.

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This Standard is identical with a pre-1997 document therefore it uses the old series of numbers.

The objective of this Standard is to provide manufacturers and users of telecontrol equipment and systems with a specification of the basic requirements for services to be provided by the link and physical layers in order to achieve system interoperability within Australia.

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CONTENTS

Page

INTRODUCTION 1

Clause

1. Scope 3

2. Object 3

3. Requirements for data transmission in telecontrol systems 3

3.1 High data integrity and data consistency 3
3.2 Short telecontrol transfer time 4
3.3 Support of bit oriented (code transparent) data transmission 4

4. Quantified rating of data integrity 4

4.1 Quantitative requirements for data integrity in telecontrol systems 5

5. Quantified rating of transmission efficiency 7

6. Transmission protocol specifications 8

6.1 Physical layer 8
6.2 Link layer 9
6.2.1 Link service classes provided 10
6.2.2 Dialogue procedures 11
6.2.3 Standard frame synchronization 12
6.2.4 Standard frame formats 12
6.2.5 Synchronization in transmission channels using switched carrier frequency 22
6.2.6 Main application fields of the defined format classes 23
6.2.7 Use of HDLC (High level data link control)-protocols 23

APPENDIX A - Effect of signal quality supervision on transmission efficiency and data integrity 24

APPENDIX B - Quantitative ratings of data integrity and transmission efficiency 28

Page

TABLE:

1 Standard frame formats and code specifications 14

FIGURES:

1 Data integrity classes 5

A.1 Bit signal detection:

a) without and
b) with signal quality supervision 26

A.2 Influence of signal quality supervision on frame transmission efficiency and on data integrity 27

B.1 Residual errors of format classes FT1.1, FT1.2, FT2 and FT3 35

B.2 Frame transmission efficiency of format classes FT1.1, FT1.2, FT2 and FT3 . . . 36

AUSTRALIAN STANDARD

Telecontrol equipment and systems

Part 5.1
Transmission protocols—Transmission frame formats

INTRODUCTION

This section highlights specific requirements and conditions for data transmission in telecontrol systems and shows ways to meet those requirements. Existing standards for data transmission protocols are adopted where they fulfil the specific telecontrol requirements.

In terms of the OSI (Open System Interconnection) reference model of ISO-CCITT, which subdivides communication into seven layers, this specifies standards for the two lowest layers, namely the physical layer and the link layer. In particular the document specifies formats for bit serial frame transmission which comply with specified classes of data integrity.

Publication 870-5-2: Section Two: Transmission Procedures (in preparation) will specify further standards for the link layer and for higher layers. This comprises dispositions for data contents within frames, i.e. services in various traffic modes and for various link - and network configurations.

The ultimate purpose of the communication function in process monitoring and control is to achieve maximum system consistency, i.e. there should be no discrepancies between the physical states of process variables and their image in the data base of the telecontrol system. This ultimate goal cannot be achieved completely. The laws of causality dictate that the information about process states is delayed and environmental noise or component failures may falsify the information. All that can be expected is that the communication allows a high degree of system consistency to be maintained. For this reason the data transmission method shall support upgraded *reliable* and *efficient* information throughput in particular for short and urgent messages. The exploitation of the installed bandwidth with respect to these two qualities is the critical measure for telecontrol protocols, because the available bandwidths are limited.

In an imperfect environment, however, high data integrity and efficient data transmission are conflicting properties: increasing demands for data integrity can be fulfilled at the expense of decreasing net speed of information flow. It is necessary, therefore, to find an acceptable compromise between these two properties, based on an analysis of the requirements. A pre-supposition for analytical treatment is the objective measurement of the required properties.

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