

Australian Standard[®]

Telecontrol equipment and systems

**Part 5.1: Transmission protocols—
Transmission frame formats**

[IEC title: Telecontrol equipment and systems, Part 5: Transmission protocols—Section One—Transmission frame formats]

This Australian Standard was prepared by Committee IT/24, Supervisory Control and Data Acquisition. It was approved on behalf of the Council of Standards Australia on 5 January 1998 and published on 5 April 1998.

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**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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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.