
**Space data and information transfer
systems — Spacecraft Onboard
Interface Systems — Low Data-
Rate Wireless Communications for
Spacecraft Monitoring and Control**

*Systèmes de transfert des informations et données spatiales —
Services d'interfaces à bord des véhicules spatiaux — Communication
sans fil à faible débit de données pour la surveillance et le contrôle des
véhicules spatiaux*

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Recommendation for Space Data System Practices

**SPACECRAFT ONBOARD INTERFACE
SYSTEMS—LOW DATA-RATE WIRELESS
COMMUNICATIONS FOR SPACECRAFT
MONITORING AND CONTROL**

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RECOMMENDED PRACTICE

CCSDS 882.0-M-1

MAGENTA BOOK

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This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS) and represents the consensus technical agreement of the participating CCSDS Member Agencies. The procedure for review and authorization of CCSDS documents is detailed in *Organization and Processes for the Consultative Committee for Space Data Systems* (CCSDS A02.1-Y-3), and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

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FOREWORD

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RECOMMENDED PRACTICE FOR LOW DATA-RATE WIRELESS COMMUNICATIONS

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CONTENTS

<u>Section</u>	<u>Page</u>
1 INTRODUCTION	1-1
1.1 PURPOSE.....	1-1
1.2 SCOPE.....	1-1
1.3 APPLICABILITY.....	1-1
1.4 RATIONALE.....	1-1
1.5 DOCUMENT STRUCTURE	1-1
1.6 DEFINITIONS	1-2
1.7 CONVENTIONS.....	1-2
1.8 REFERENCES	1-3
2 OVERVIEW	2-1
2.1 RATIONALE AND BENEFITS	2-1
2.2 SCOPE OF INTEROPERABILITY	2-1
2.3 EVOLUTION OF THE BOOK.....	2-2
2.4 DIFFERENTIATING CONTENTION-BASED AND SCHEDULED CHANNEL ACCESS	2-3
2.5 SECURITY PROVISIONING	2-4
2.6 QUALITY OF SERVICE PROVISIONING	2-4
3 RECOMMENDED PRACTICES FOR LOW DATA-RATE WIRELESS COMMUNICATIONS FOR SPACECRAFT MONITORING AND CONTROL	3-1
3.1 OVERVIEW	3-1
3.2 RECOMMENDED PRACTICES.....	3-1
ANNEX A JUSTIFYING THE SCHEDULED MEDIUM ACCESS RECOMMENDATION (INFORMATIVE)	A-1
ANNEX B SECURITY CONCERNS FOR WIRELESS SYSTEMS (INFORMATIVE)	B-1
ANNEX C DISCUSSION ON LOW DATA-RATE WIRELESS COMMUNICATIONS FOR SPACECRAFT MONITORING AND CONTROL (INFORMATIVE)	C-1
ANNEX D JUSTIFICATIONS FOR THE 2.4 GHZ BAND PREFERENCE (INFORMATIVE)	D-1
ANNEX E ABBREVIATIONS AND ACRONYMS (INFORMATIVE)	E-1
ANNEX F INFORMATIVE REFERENCES (INFORMATIVE)	F-1

CONTENTS (continued)

<u>Figure</u>		<u>Page</u>
2-1	IEEE 802.15.4 Superframe	2-5
 <u>Table</u>		
2-1	PHY/MAC Security Service Provisioning	2-4
C-1	Application Profile Quick Look-Up Table	C-4
C-2	Quick-Look Table for Scenarios That Can Utilize Low Data-Rate Wireless Communications	C-4
C-3	Typical Operating Parameters for the Single-Hop, Periodic Data Aggregation Application Profile	C-6
C-4	Typical Operating Parameters for the Single-Hop Triggered, Event-Driven Data Acquisition Application Profile	C-7
C-5	Typical Operating Parameters for the Single-Hop Command and Control Application Profile	C-9
D-1	Power Regulations	D-2

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1 INTRODUCTION

1.1 PURPOSE

This document presents the recommended practices for the utilization of low data-rate wireless communication technologies in support of spacecraft ground testing and flight monitoring and control applications. Relevant technical background information can be found in reference [3].

The recommended practices contained in this document enable member agencies to select the best option(s) available for interoperable wireless communications in the support of spacecraft monitoring and control applications. The specification of a Recommended Practice facilitates interoperable communications and forms the foundation for cross-support of communication systems between separate member space agencies.

1.2 SCOPE

This Recommended Practice is targeted towards monitoring and control systems, typically low data-rate and low-power wireless-based applications.

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1.3 APPLICABILITY **(standards.iteh.ai)**

This Recommended Practice specifies protocols (including at least the Physical [PHY] layer and Medium Access Control [MAC] sublayer of the Open Systems Interconnection [OSI] Model—see reference [F1]) that enable a basic interoperable wireless communication system to support low data-rate spacecraft monitoring and control applications.

1.4 RATIONALE

From an engineering standpoint, mission managers, along with engineers and developers, are faced with a plethora of wireless communication choices, both standards-based and proprietary. This Recommended Practice provides guidance in the selection of systems necessary to achieve interoperable communications in support of wireless, low data-rate monitoring and control.

1.5 DOCUMENT STRUCTURE

This document is composed from a top-down (technology) perspective, first defining the technology as a recommended practice, then providing informative material supporting specific application profiles. (For more information on space mission use cases addressed by wireless technologies, see reference [3]).

Section 2 provides an informational overview of the rationale and benefits of spacecraft onboard wireless technologies for use in spacecraft monitoring and control operations.