

INTERNATIONAL STANDARD

ISO/IEC 11518-9

First edition
1999-04

Information technology – High-Performance Parallel Interface – Part 9: Serial Specification (HIPPI-Serial)

© ISO/IEC 1999

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève 20 • Switzerland



PRICE CODE

M

For price, see current catalogue

This is a preview - click here to buy the full publication

CONTENTS

	Page
FOREWORD	iii
INTRODUCTION	iv
Clause	
1 Scope.....	1
2 Normative references	1
3 Definitions and conventions	2
3.1 Definitions.....	2
3.2 Editorial conventions.....	4
3.3 Acronyms and other abbreviations	4
4 System overview.....	4
4.1 Functional units	5
4.3 Non-HIPPI-PH control signals, OH_n (Overhead bits)	6
4.4 Serial data input and output.....	6
4.5 Configurations	6
5 Transmit section	6
5.1 Encoding the 20-bit data fields	6
5.2 Encoding F0, F1 with REQUEST, PACKET, and BURST	6
5.3 Encoding M0, M1 with CONNECT, READY, and OH_n	7
5.5 Transmit section clock signals.....	10
6 Receive section.....	11
6.1 Receive section clock signals.....	11
6.2 Operating on the 24-bit frames.....	11
6.3 Decoding 20-bit data fields	12
6.4 Decoding F0, F1 into REQUEST, PACKET, and BURST	12
6.5 Decoding M0, M1 into CONNECT, READY, and OH_n	12
7 Link Control.....	13
7.1 Link Control output signals	13
7.2 Link Control input signals	13
7.3 Link reset.....	13
8 Serial optical interface.....	14
8.1 General specifications	14
8.2 Fibre type.....	15
8.3 Optical connectors.....	15

Tables

Table 1 – 20-bit data field structure	7
Table 2 – REQUEST, PACKET and BURST coding in F0 and F1	7
Table 3 – M0, M1 contents	7
Table 4 – Overhead bit (OHn) functions	8
Table 5 – Overhead bit 1 (OH1) coding	8
Table 7 – General long wavelength optical specifications over single-mode fibre.....	15
Table 8 – General long wavelength optical specifications over multimode fibre	16
Table 9 – General short wavelength optical specifications	16

Figures

Figure 1 – 32-bit, dual-simplex, HIPPI-Serial functional units example	5
Figure 2 – Link reset state diagram	13
Figure 3 – Transmitter eye diagram mask	15
Figure A.1 – SUBMUX block diagram.....	18
Figure A.2 – SUBDEMUX block diagram.....	18
Figure D.1 – Remote and local loopback.....	24

Annexes

A Implementation suggestions.....	17
A.1 Example SUBMUX circuit.....	17
A.2 Example SUBDEMUX circuit.....	17
A.3 TLI and RLI availability	17
B Additional optical information.....	19
B.1 Eye measurements with an oscilloscope.....	19
B.2 Optical power.....	19
B.3 Optical spectrum.....	19
B.4 Eye safety	19
B.5 Loss budget examples.....	19
C HIPPI-PH signal relationships	21
C.1 REQUEST, PACKET, and BURST	21
C.2 Control signals during errors	21
D HIPPI-PH Extender	23
D.1 HIPPI-PH signals.....	23
D.2 HIPPI-Serial Extender loopbacks	23
D.3 HIPPI-Serial Extender front panel user interface	25
E Bibliography	26

Information technology – High-Performance Parallel Interface –

Part 9: Serial Specification (HIPPI-Serial)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 11518-9 was prepared by subcommittee 25: *Interconnection of information technology equipment*, of ISO/IEC Joint Technical Committee 1: *Information technology*.

ISO/IEC 11518 consists of the following parts, under the general title *Information technology – High-Performance Parallel Interface*:

- Part 1: *Mechanical, electrical, and signalling protocol specification (HIPPI-PH)*
- Part 2: *Framing Protocol (HIPPI-FP)*
- Part 3: *Encapsulation of ISO/IEC 8802-2 (IEEE Std 802.2) Logical Link Control Protocol Data Units (HIPPI-LE)*
- Part 4: *Mapping of HIPPI to IPI device generic command sets (HIPPI-IPI)*
- Part 5: *Memory Interface (HIPPI-MI)*
- Part 6: *Physical Switch Control (HIPPI-SC)*
- Part 8: *Mapping to Asynchronous Transfer Mode (HIPPI-ATM)*
- Part 9: *Serial Specification (HIPPI-Serial)*

Annexes A to E of this part of ISO/IEC 11518 are for information only.

Introduction

This High-Performance Parallel Interface, Serial Specification (HIPPI-Serial), defines a physical-level interface for transmitting digital data at 800 Mbit/s or 1 600 Mbit/s serially over fibre-optic cables across distances of up to 10 km. The signalling sequences and protocol used are compatible with HIPPI-PH, ISO/IEC 11518-1, which is limited to 25 m distances. HIPPI-Serial may be integrated as a host's native interface, or used as an external extender for HIPPI-PH ports.

Characteristics of a HIPPI Serial interface include:

- Point-to-point connections use one or two pairs of fibre-optic cables for distances of up to 10 km.
- Long wavelength and short-wavelength optics options.
- May be used in a simplex or duplex configuration.
- Support for 800 Mbit/s or 1 600 Mbit/s data rates.
- Use as an integrated host interface without an intervening HIPPI-PH is supported.
- Use as an external extender for HIPPI-PH ports is supported.
- The coding scheme provides low-latency, automatic link reset, and robust operation.

Information technology – High-Performance Parallel Interface –

Part 9: Serial Specification (HIPPI-Serial)

1 Scope

This part of ISO/IEC 11518 specifies a physical-level interface for transmitting digital data at 800 Mbit/s or 1 600 Mbit/s serially over fibre-optic cables across distances of up to 10 km. The signalling sequences and protocol used are compatible with HIPPI-PH, ISO/IEC 11518-1, which is limited to 25 m distances. HIPPI-Serial may be integrated as a host's native interface, or used as an external extender for HIPPI-PH ports.

Specifications are included for:

- the encoding and serialisation of the parallel data;
- the sequence of signals required for link reset;
- the timing and optical requirements of the serial signals;
- 32-bit (800 Mbit/s, 100 MByte/s) and 64-bit (1 600 Mbit/s, 200 MByte/s) operation;
- simplex and dual simplex operation.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 11518. At the time of

publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 11518 are encouraged to investigate the possibility of applying the most recent edition of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11518-1:1995, *High-Performance Parallel Interface – Part 1: Mechanical, electrical, and signalling protocol specification (HIPPI-PH)*

ISO/IEC 14165-111:199x, *Fibre Channel – Part 111: Physical and Signalling Interface (FC-PH)*

ITU-T G.652: *Characteristics of a single mode optical fibre cable*

IEC 61300-3-6: *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61280-1-3: *Fibre optic communication sub-system basic test procedures – Part 1-3: Test procedures for general communication sub-systems – Central wavelength and spectral width measurement*

IEC 61280-2-1: *Fibre optic communication sub-system basic test procedures – Part 2-1: Test procedures for digital systems – Receiver sensitivity and overload measurement*