

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	5
1 Scope.....	7
2 Normative reference	7
3 Definitions, terms and abbreviations	7
3.1 Terms and definitions	7
3.2 Abbreviations	8
4 Conformance.....	8
5 Responsive Link structure	8
5.1 Outline of Responsive Link	8
5.2 OSI reference model	9
6 Layer 1 (physical layer)	9
6.1 Separate transmission of data and event.....	9
6.2 Physical interface	9
7 Layer 2 (data link layer).....	10
7.1 Error correction	10
7.1.1 General	10
7.1.2 CODEC	10
7.1.3 Error correction encoding	10
7.1.4 Bit stuffing	10
7.1.5 NRZI encoding	11
7.2 Frame format.....	11
7.2.1 Packet	11
7.2.2 Frame.....	11
7.2.3 Setup pattern.....	11
7.2.4 Idle pattern	11
7.2.5 Bit synchronization and clock rate	11
7.2.6 Error handling.....	12
7.3 Automatic reconfiguration (plug and play).....	12
8 Layer 3 (network layer).....	12
8.1 Packet overtaking function	12
8.2 Responsive Link packet format.....	12
8.2.1 Header format	12
8.2.2 Priority.....	13
8.2.3 Data packet	13
8.2.4 Event packet	14
8.3 Routing	15
8.3.1 General	15
8.3.2 Routing table.....	15
8.3.3 Independent routing of data and event.....	16
8.3.4 Priority-based routing	16
9 Layer 4 (transport layer).....	16
9.1 Priority replacement for packet acceleration/deceleration	16
9.2 Multi-link	17

9.3 Stream data transmission	17
Annex A (informative) Characteristics of real-time communications.....	18
Annex B (informative) Real-time scheduling.....	19
Annex C (informative) An implementation of the Responsive Link interface.....	20
Annex D (informative) Examples of implementation	21
D.1 An implementation of the Responsive Link switch.....	21
D.2 An implementation of overtaking buffers	22
Annex E (informative) Examples of routing of data and event.....	23
E.1 An example of independent routing of data and event.....	23
E.2 An example of priority based routing.....	23
Bibliography.....	24
Figure 1 – A humanoid robot.....	6
Figure 2 – Logical interface of Responsive Link	9
Figure 3 – Header format.....	13
Figure 4 – Data packet format.....	13
Figure 5 – Trailer format of data packet	13
Figure 6 – Event packet format	14
Figure 7 – Trailer format of event packet.....	15
Figure 8 – Routing table	16
Figure B.1 – EDF scheduling	19
Figure C.1 – Responsive Link connector and cable.....	20
Figure D.1 – A Responsive Link switch	21
Figure D.2 – An overtaking buffer	22
Figure E.1 – An example of routing.....	23
Table 1 – Syndrome and error digits	10
Table 2 – Frame format	11
Table A.1 – Syndrome and error digits.....	18
Table C.1 – Maximum cable length	20