Information technology_- Responsive Link (RL)

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