

# **The SpaceWire Handbook**

Editor: Barry M Cook, (4Links Limited, UK)

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**Note to readers:**

This is a first draft containing placeholders and very brief notes on proposed content.

Comments and (offers of) contributions are welcome:

Email [Barry@4links.co.uk](mailto:Barry@4links.co.uk) (subject "SpaceWire Handbook", please)

I have given highest priority to Appendix A: a list of papers relating to SpaceWire. I know this list is incomplete and especially invite input here.

Introduction / Abstract / Executive summary

Status: To be written

Priority: high

## **History**

20090107: Version1 - Draft B.M.Cook, 4Links Limited

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## **1. Context and concepts**

Status: To be written

Priority: high

### **1.1 Comparison with existing standards**

Briefly describe MIL1553 and indicate its limitations (speed, poor scaling, fault tolerance ...). Do same for CANbus and also (very briefly) for USB/firewire. Describe SpaceWire (without too much detail) in contrast to busses (higher speed, good scaling, enhanced fault tolerance, ...).

### **1.2 Concepts**

SpaceWire links and networks in more detail:

Data: Packets, routing, addressing

Time: time code broadcast

## **3. Guide to ECSS standards**

Include the useful material no longer in the standard(s) due to tighter rules. (Already removed from the Protocols standard and expected to be removed from the revised SpaceWire standard).

Describe meanings of terms used as aid to understanding the standards (e.g. normative/informative, shall/may, ...)

Status: To be written

Priority: ?

### **3.1 SpaceWire ECSS (was ECSS)**

Status: To be written (now or wait for revision?)

Priority: ?

### **3.2 SpaceWire Protocols**

Status: To be written, any volunteers? (Steve Parkes / WG members?)

Priority: middle

## **4. Components**

What are available

Status: To be written

Priority: high

Action: Compile list – may be problems with ESA document referencing commercial products/ sites

## **5. Network architectures**

Possibilities, merits and problems

Status: Some material available, more required

Priority: middle

## **6. Verification and Validation**

Status: ?

Priority ?

## **7. Mission views**

Reasons to choose SpaceWire

Benefits of choosing SpaceWire

Challenges from using SpaceWire

Status: Some material offered, more required

Priority: middle

## **8. Future evolution**

Ongoing and possible

Status: To be written (RT / SpF: by group members?, other topics by ?)

Priority: middle

## **9. History**

Status: material is available

Priority: low

## **Appendix A. Papers On or Relating-To SpaceWire**

Status: Incomplete (Known to be missing: many DASIA, ...)

Priority: high

Action: All readers: email [Barry@4links.co.uk](mailto:Barry@4links.co.uk) (subject: SpaceWire Handbook) with any missing items.

Action: All readers: comment on / suggest other topic headings

(Roughly) Sorted by topic, most recent first.

### **Abbreviations used**

CPA	Communicating Process Architectures (conference)
DASIA	Data Systems in Aerospace
IAC	International Astronautical Congress
ICAED	International Conference on Advanced Engineering Design
IGARSS	???
ISC	International SpaceWire Conference
ISWS	International SpaceWire Seminar
MAPLD	Military and Aerospace Programmable Logic Devices
NPSS	IEEE-NPSS Real Time Conference
SDSS	???
SmallSat	AIAA/USU Conference on Small Satellites
Spaceops	International Conference on Space Operations
SpW	SpaceWire
WG	working group

### **Reference Documents**

- ECSS-50-12A
- ECSS-50-11
- [CCSDS SOIS Services Green Book](#) (CCSDS 850.0-G-0b, November 2006)
- [SpW-SnP-PID](#) (Draft B, January 2005)
- [SpW-SnP-RMAP](#) (Draft F, 4th December 2006)
- [GOES-R Reliable Data Delivery Protocol](#) (GRDDP), (1<sup>st</sup> of July 2005)
- [SpaceWire Router Data Sheet](#), UoD\_SpW-10X\_DataSheet (Issue 2.0, 18th August 2006)

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## **Backplanes**

- [Evaluation and Analysis of Connector Performance for the SpaceWire Back Plane](#)  
K. Shibuya, K. Yamagashi, H. Oh-hashii, S. Saito, M. Nomachi [Abstract - Presentation](#)  
ISC 2008-11
- [Introduction](#) (to session on backplanes)  
M. Nomachi (University of Osaka) SpW WG #11 2008-06
- [SpaceWire Active Backplanes & Backplanes-Hypertac-Connectors](#)  
A.Senior (SEA) SpW WG #11 2008-06
- [Serial Backplane for SpaceWire](#)  
Masaharu Nomachi, Shuuhei Ajimura, [Abstract - Presentation](#)  
ISC 2007-09
- [JAXA presentation on Backplanes](#)  
M. Nomachi SpW WG #6 2006-05

## **Cable / Connectors**

- [SpaceWire Cabling in an Operationally Responsive Space Environment](#)  
Derek Schierlmann, Paul Jaffe, [Abstract - Presentation](#)  
ISC 2007-09
- [Mapping of SpaceWire signals into a 38999 series 4 circular connector](#),  
Schierlmann, NRL SpW WG #8 2007-01
- [Cables and Connectors](#)  
M. Wahl, GORE SpW WG #6 2006-05
- [ECSS-E50-12A Maintenance Specific issues on cables](#)  
Shaune.S.Allen, NASA SpW WG #1 2004-09

## **CCSDS / SOIS**

- [Proposed SOIS Plug-and-Play Architecture and Resulting Requirements on SpaceWire Mapping](#)  
Stuart D. Fowell, Chris Taylor, [Abstract - Presentation](#)  
ISC 2007-09
- [Introduction on SOIS](#)  
C. Taylor, ESA/ESTEC, SpW WG #9 2007-04
- [Overview and Specific Topics on Subnetwork Services](#)  
Keltik, D. Stanton SpW WG #9 2007-04
- [Overview and Specific Topics on Application layer support Services](#)  
Scisys, S. Fowell SpW WG #9 2007-04
- [Analysis of the CCSDS, SOIS services](#)  
T. Yamada, JAXA, SpW WG #9 2007-04
- [SpW and SOIS services–Overview](#)  
S. Parkes, UoD SpW WG #9 2007-04
- [SpW Implementation of SOIS SubNet Services assessment](#)  
D. Jameux, ESA/ESTEC, SpW WG #9 2007-04
- [SOIS Services and SpaceWire Features](#)  
Y. Sheynin, UoStPb SpW WG #9 2007-04



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**Initial collection of headings and words**

- [Major outcomes and Way forward](#)  
C.Taylor, ESA/ESTEC SpW WG #9 2007-04
- [Status of CCSDS SOIS Services definition](#)  
Ph. Armbruster, ESA/ESTEC, SpW WG #8 2007-01
- [CCSDS SOIS Services Green Book](#) (CCSDS 850.0-G-0b, November 2006)  
SpW WG #8 2007-01
- [Mapping of CCSDS services on Mil1553B](#)  
O. Notebaert, ECSS-E50-13 Convenor, Astrium, SpW WG #8 2007-01
- [ESA Presentation on CCSDS SOIS Status](#)  
C. Taylor SpW WG #6 2006-05
- [UoD Presentation on CCSDS SOIS TCONS/OBL](#)  
S. Parkes SpW WG #6 2006-05
- [CCSDS Time-critical Onboard Networking Service](#)  
S. Parkes, R. Schnurr, J. Marquart, G. Menke, M. Ciccone Spaceops 2006
- [SpaceWire and CCSDS SOIS](#)  
Parkes, UoD SpW WG #5 2005-11
- [CCSDS SOIS and SpW](#)  
S Parkes, UoD SpW WG #4 2005-07
- [CCSDS related activities](#)  
Steve Parkes, UoD SpW WG #1 2004-09

## Components

- [Evolution and Applications of System on a chip SpaceWire Components for Spaceborne Missions](#) J. Marshall [Abstract - Presentation](#)  
ISC 2008-11
- [SpW-10X Router ASIC Testing and Performance](#) [Abstract - Presentation](#)  
S. Parkes, C. McClements, G. Kempf, C. Gleiss, S. Fischer, P. Fabry  
ISC 2008-11
- [Design and Implementation of Synthesizable SpaceWire Cores](#) [Abstract - Presentation](#)  
P. Aguilar-Jiménez, V. López, S. Sánchez, M. Prieto, D. Meziat, ISC 2007-09
- [The GRSPW SpaceWire Codec IP Core and Its Application](#) [Abstract - Presentation](#)  
Sandi Habinc, Marko Isomäki, Jiri Gaisler  
ISC 2007-09
- [SpaceWire IP for Actel Radiation Tolerant FPGAs](#) [Abstract - Presentation](#)  
Steve Parkes, Chris McClements, Zaf Mahmood, ISC 2007-09
- [Monolithic Radiation Tolerant Multi-Gigabit SpaceWire Fiber/Copper Transponder with Minimal Delay Synchronization](#) [Abstract](#)  
Vladimir Katzman, Glenn P. Rakow, Vladimir Bratov, Sean Woyciehowsky, Jeb Binkley  
ISC 2007-09
- [ATMEL SpaceWire Products Family](#) [Abstract - Presentation](#)  
Nicolas Renaud, Yohann Bricard, ISC 2007-09
- [SpaceWire Router ASIC](#) [Abstract - Presentation](#)  
Steve Parkes, Chris McClements, Gerald Kempf, Stephan Fischer, Agustin Leon,  
ISC 2007-09

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- [SpaceWire Remote Terminal Controller](#)  
Jorgen Ilstad, Wahida Gasti, Peter Sinander, Sandi Habinc, [Abstract - Presentation](#)  
ISC 2007-09
- [SpaceWire Device Driver for the Remote Terminal Controller](#)  
Albert Ferrer Florit, Wahida Gasti, [Abstract - Presentation](#)  
ISC 2007-09
- ['Multibort'--the Chipset for Distributed Signal Processing and Control with SpaceWire Interconnections](#)  
Tatiana Solokhina, Alexander Glushkov, Ilya Alexeev, Yuriy Sheynin, Elena Suvorova, Felix Shutenko, [Abstract - Presentation](#)  
ISC 2007-09
- [A System-on-chip Radiation Hardened Microcontroller ASIC with Embedded SpaceWire Router](#)  
Richard Berger, Laura Burcin, David Hutcheson, Jennifer Koehler, Marla Lassa, Myrna Milliser, David Moser, Dan Stanley, Randy Zeger, Ben Blalock, Mark Hale, [Abstract - Presentation](#)  
ISC 2007-09
- [A Hardened One Chip Solution for High Speed SpaceWire System Implementations](#)  
Joseph R. Marshall, Richard W. Berger, Glenn P. Rakow [Abstract - Presentation](#)  
ISC 2007-09
- [MCFlight™ - MULTICORE platform based chipset with SpaceWire links for distributed Aerospace systems](#)  
T. Solokhina, Elvees, SpW WG #8 2007-01
- [Remote Terminal Controller](#)  
T. Hult, Saab Ericsson SpW WG #6 2006-05
- [SpaceWire Interface products](#)  
D. Stevenson, Aeroflex SpW WG #6 2006-05
- [SpW Router Status](#)  
Estec SpW WG #6 2006-05
- [SMCS332-SpW and SMCS116-SpW Status](#)  
Estec for Astrium SpW WG #6 2006-05
- [SpW Devices Development Status in Russia](#)  
Y. Sheynin, St.Petersburg, UoAI SpW WG #6 2006-05
- [SpaceWire developments performed at Gaisler Research](#)  
J. Gaisler SpW WG #6 2006-05
- [SpW based Intelligent Camera for Navigation](#)  
S. Parkes, UoD SpW WG #6 2006-05
- [SpW/RMAP based Video Processing Chain](#)  
K. Grange and F. Lachaud, Sodern SpW WG #6 2006-05
- [Space Cube](#)  
M. Nomachi SpW WG #6 2006-05
- [SpaceWire Codec status and validation](#)  
S. Parkes UoD (UK) SpW WG #5 2005-11
- [SpW router ASIC development](#)  
G Kempf, AAe SpW WG #4 2005-07
- [RTC ASIC](#)  
T. Hult, Saab Ericsson SpW WG #4 2005-07
- [Status of the SMCS332SpW validation and the SMCS116WpW development](#)  
P. Rastetter, Astrium GmbH SpW WG #4 2005-07

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- [SpaceWire Router Asic, features and status](#)  
G. Kempf, Austrian Aerospace SpW WG #3 2005-02
- [Differences between SMCS332/SMCS332-SpW, SMCS116/SMCS116-SpW](#)  
L. Tunesi, ESA SpW WG #1 2004-09
- [Summary of the Remote Terminal Controller preliminary specifications](#)  
L. Tunesi, ESA SpW WG #1 2004-09
- [Status of the SpW Router development](#)  
S. Fischer, Astrium SpW WG #1 2004-09
- [Short presentation of devices under development by NASA](#)  
R. Schnurr, G. Rakow SpW WG #1 2004-09
- [Short Presentation on design activities by Xilinx](#)  
Fancesco Contu SpW WG #1 2004-09
- [Router Configuration port access/configuration management](#)  
S. Parkes, UoD SpW WG #1 2004-09
- [The SpaceWire CODEC](#)  
Chris Mc Clements ISWS 2003-11
- [Procurement of the ESA-UoD SpaceWire CODEC](#)  
Agustin Fernandez-Leon ISWS 2003-11
- [SpaceWire Router](#)  
Steve Parkes ISWS 2003-11
- [MCFlight-SOC Based Chipset with SpaceWire Links for Aerospace Applications](#)  
Tatiana Solokhina ISWS 2003-11
- [The ASTRIUM-Velizy SpaceWire IP core](#)  
Jean-Francois Coldefy ISWS 2003-11
- [SpaceWire-PCMCIA Card Development](#)  
Jaakko Toivonen ISWS 2003-11
- [The New SMCS332 / SMCSLite SpaceWire ASIC](#)  
Stephan Fischer ISWS 2003-11
- [Intervention from ATMEL](#)  
Dominique de Saint-Roman ISWS 2003-11
- Customisable-off-the-shelf Digital Signal Processing Board for Space Applications  
H Reichinger & M Sust, Austrian Aerospace DASIA 2003-06
- Development and Test Results of a System On A Chip for a Data Handling System  
Christian Boleat, Jean-Francois Coldefy, Marc Lefebvre, Marc Souyri DASIA 2003-06
- MCM ERC32 Integrated SPARC Computer Core  
Christian Boleat, Jean-Francois Coldefy, Marc Souyri DASIA 2003-06

### **Distributed Interrupts**

- [Distributed Interrupts Mechanism Verification and Investigation by Modelling on SDL and SystemC](#)  
L. Onishchenko, A. Eganyan, I. Lavrovskaya [Abstract](#)  
ISC 2008-11

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- [Distributed Interrupts in SpaceWire networks](#)  
Y. Sheynin, UoStP, [Presentation](#)  
SpW WG #8 2007-01
- [StP-UoAI presentation on Distributed Interrupts](#)  
Y. Sheynin SpW WG #6 2006-05
- [SpaceWire Interrupt Codes](#)  
Y. Sheynin and S. Gorbachev, SUAI SpW WG #2 2004-11

## **Electrical**

- [SpaceWire Physical Layer Fault Isolation](#)  
B. Cook, W. Gasti, S. Landstroem [Abstract - Presentation](#)  
ISC 2008-11
- [SpaceWire Link interface: LVDS, Power & Cross-strapping Aspects](#)  
W.Gasti & S.Landstroem (ESTEC) SpW WG #11 2008-06
- Reducing Electromagnetic Emissions from SpaceWire  
Barry M Cook, C Paul H Walker, 4Links DASIA 2007-05

## **IP**

- [SpaceWire RMAP IP Core](#)  
S. Parkes, C. McClements, M. Dunstan, W. Gasti [Abstract - Presentation](#)  
ISC 2008-11
- [SpaceWire CODEC IP Core Update](#)  
C. McClements, S. Parkes, K. Marinis [Abstract - Presentation](#)  
ISC 2008-11
- SpaceWire on FPGA – Challenges and Solutions  
B M Cook, C Paul H Walker DASIA 2008-05
- [IP Macrocell for SpaceWire I/F Compliant with AMBA-APB BUS](#)  
Luca Fanucci ISWS 2003-11
- [SpaceWire: IP, Components, Development Support and Test Equipment](#)  
S. Parkes, C. McClements, S. Mills, I. Martin DASIA 2003-06

## **Low Speed**

- [SpaceWire Standard: Low Speed Signalling Rates](#)  
C. McClements, S. Parkes, [Abstract - Presentation](#)  
ISC 2008-11

## **Miscellaneous**

- [Redundancy Mechanism Update](#)  
G. Rakow, NASA GSFC SpW WG #8 2007-01
- [Roscosmos and SpW achievements in Russia](#)  
A. Stepanov, ROSCOSMOS, SpW WG #8 2007-01
- [Further SpaceWire Support from 4Links](#)  
P. Walker, 4Links SpW WG #8 2007-01

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**Initial collection of headings and words**

- [Prototyping with SpW in Japan](#)  
M.Nomachi, UoO, SpW WG #8 2007-01
- [SpaceWire Data Handling Demonstration System](#)  
S. Mills, S. Parkes, N. O’Gribin DASIA 2007-05
- [Unionics Requirements](#)  
D. Durrant, SEA SpW WG #1 2004-09
- [Short reminder of SpW packet structure and Addressing modes](#)  
S. Parkes, UoD SpW WG #1 2004-09
- [Building SpaceWire Systems](#)  
Paul Walker ISWS 2003-11
- [Networks, CCSDS SOIF and Support Tools: SpaceWire Research at Dundee](#)  
S. Parkes ISWS 2003-11

## **Missions & Applications**

- [Data Acquisition System of the PoGOLite Balloon Experiment](#) [Abstract - Presentation](#)  
H. Takahashi, Y. Umeki, H. Yoshida, T. Tanaka, T. Mizuno, Y. Fukazawa, T. Kamae, G. Madejski, H. Tajima, M. Kiss, W. Klamra, S. Larsson, C. Marini Bettolo, M. Pearce, S. Rydstrom, K. Kurita, Y. Kanai, M. Arimoto, M. Uneo, J. Kataoka, N. Kawai, M. Axelsson, L. Hjalmarsdotter, F. Ryde, G. Bogaert, S. Gunji, T. Takahashi, G. Varner, T. Yuasa  
ISC 2008-11
- [SpaceWire in the Simbol-X Hard X-Ray Mission](#) [Abstract - Presentation](#)  
C. Cara, F. Pinsard ISC 2008-11
- [RMAP over SpaceWire on the ExoMars Rover for Direct Memory Access by Instruments to Mass Memory](#) [Abstract - Presentation](#)  
B. Dean, R. Warren, B. Boyes ISC 2008-11
- [Standard Onboard Data Handling Architecture based on SpaceWire](#) [Abstract - Presentation](#)  
T. Yamada, T. Takahashi ISC 2008-11
- [SpaceWire Test and Demonstration Utilising the Integrated Payload Processing Module](#) [Abstract - Presentation](#)  
J. Ilstad, D. Jameux ISC 2008-11
- [SpaceWire Application for the X-Ray Microcalorimeter Instrument onboard the Astro-H Mission](#) [Abstract - Presentation](#)  
Y. Ezoe, Y. Ishisaki, T. Ohashi, K. Shinosaki, Y. Takei, N. Yamasaki, K. Mitsuda, K. Sato, R. Fujimoto, Y. Terada, M. Tashiro, R.L. Kelley, J. Willem den Herder  
ISC 2008-11
- [Digital Signal Processing Systems of an X-ray Microcalorimeter Array for Ground and Space Applications](#) [Abstract - Presentation](#)  
T. Hagihara, K. Mitsuda, N. Yamasaki, Y. Takei, H. Odaka, M. Nomachi, T. Yuasa  
ISC 2008-11
- [System Aspects of SpaceWire Networks](#) [Abstract](#)  
P. Rastetter, S. Fischer, U. Liebstickel, R. Wiest ISC 2008-11
- [PaDaPAr Study and demonstrator](#)  
O. Notebaert, Astrium Satellites SpW WG #9 2007-04
- [Magnetospheric MultiScale Mission \(MMS\) Implementation of SpaceWire](#)  
G. Jackson, D. Raphael and G. Rakow, NASA GSFC SpW WG #8 2007-01

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- [The Geostationary Operational Satellite R Series SpaceWire Implementation](#)  
William H. Anderson, Alexander Krimchansky, Glenn P. Rakow,  
, [Abstract - Presentation](#)  
ISC 2007-09
- [PnPSAT](#)  
Donald Fronterhouse, [Abstract - Presentation](#)  
ISC 2007-09
- [Overview of the INTA \$\mu\$ SAT's Data Architecture Based on SpaceWire](#) [Abstract - Presentation](#)  
D. Guzmán, M. Angulo, L. Seoane, S. Sánchez, M. Prieto, D. Meziat, [ISC 2007-09](#)
- [SpaceWire for Operationally Responsive Space as Part of TacSat-4](#) [Abstract - Presentation](#)  
Paul Jaffe, Greg Clifford, Jeff Summers, [ISC 2007-09](#)
- [SWFU: SpW Interface Unit for Versatile Sensor Integration on the ExoMars Chassis Breadboard](#) C. G.-Y. Lee, R. Obstei, [Abstract](#)  
[ISC 2007-09](#)
- [Application of SpaceWire to Future Satellite Data Processing System](#) [Abstract - Presentation](#)  
Kenji Matsuda, Kazunori Masukawa, Shigeru Ishii, Yo Watanabe, Yoshikatsu Kuroda, Motohide Kokubun, Masanobu Ozaki, Tadayuki Takahashi, Masaharu Nomachi  
[ISC 2007-09](#)
- [Development of a SpaceWire-based Data Acquisition System for a Semiconductor Compton Camera](#) [Abstract - Presentation](#)  
Hirokazu Odaka, Motohide Kokubun, Takeshi Takashima, Tadayuki Takahashi, Takayuki Yuasa, Kazuhiro Nakazawa, Kazuo Makishima, Masaharu Nomachi, Hiroki Hihara, Takayuki Tohma, [ISC 2007-09](#)
- [The SpaceWire Interfaces for HERSCHEL/SCORE Suborbital Mission](#) [Abstract - Presentation](#)  
M. Pancrazzi, A. Gherardi, M. Focardi, G. Rossi, D. Paganini, E. Pace, M. Romoli, E. Antonucci, [ISC 2007-09](#)
- [Introduction of SpaceWire Applications for the MMO Spacecraft in BepiColombo Mission](#) [Abstract - Presentation](#)  
T. Takashima, H. Hayakawa, H. Ogawa, Y. Kasaba, M. Koyama, K. Masukawa, M. Kawasaki, S. Ishii, Y. Kuroda, BepiColombo MMO Project Data-Handling Team, [ISC 2007-09](#)
- [Development of a SpW/RMAP-based Data Acquisition Framework for Scientific Detector Applications](#) [Abstract - Presentation](#)  
Takayuki Yuasa, Kazuhiro Nakazawa, Kazuo Makishima, Hirokazu Odaka, Motohide Kokubun, Takeshi Takashima, Tadayuki Takahashi, Masaharu Nomachi, Iwao Fujishiro, Fumio Hodoshima, [ISC 2007-09](#)
- [SpW Application at Alcatel Alenia Space](#)  
A. Girard [SpW WG #6 2006-05](#)
- [SpW Applications for Robotics Applications at Canadian Space Agency](#)  
D. Jameux, Estec [SpW WG #6 2006-05](#)
- [SpW Activities, update from JAXA](#)  
T. Yoshimitsu, M. Nomachi [SpW WG #6 2006-05](#)
- [SpW Application to missions: BepiColombo & NeXT](#)  
Y.Kasaba, JAXA/ISAS [SpW WG #4 2005-07](#)
- [Possible applications of Space Wire standard to Scientific missions](#)  
H. Hayakawa, ISAS/JAXA [SpW WG #1 2004-09](#)
- [A Data Readout System with High-Speed Serial Data Link](#)  
M. Nomachi, Osaka University [SpW WG #1 2004-09](#)
- [Highly Integrated Payload Suites and Related Data Link Requirements](#)  
Peter Falkner [ISWS 2003-11](#)

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## Networks / Architectures & Protocols

- [Prototype Implementation of a Routing Policy using Flexray Frames Concept over a SpaceWire Network](#) [Abstract - Presentation](#)  
ISC 2008-11  
S. Gunes-Lasnet, O. Notebaert
- [SoCWire: A SpaceWire inspired fault tolerant Network-on-chip for Reconfigurable System-on-chip Designs in Space Applications](#) [Abstract - Presentation](#)  
ISC 2008-11  
Osterloh, H. Michalik, B. Fiethe
- [Design Considerations for Adapting Legacy System Architectures to SpaceWire](#) [Abstract - Presentation](#)  
ISC 2008-11  
R. Klar, C.Mangels, S. Dykes, M. Brysch
- [Embedded network architectures for mobile devices](#) SpW WG #9 2007-04  
M. Gillet and S. Balandin, Nokia,
- [Different uses of logical addresses: Implementation of bandwidth allocation schemes](#) SpW WG #9 2007-04  
A. Ferrer Florit, ESA/ESTEC
- [A Link-Layer Broadcast Service for SpaceWire Networks](#) - [Presentation](#)  
SpW WG #8 2007-01  
S. Dykes, Southwest Research Institute,
- [Comparison of Communication Architectures for Spacecraft Modular Avionics Systems](#) SpW WG #8 2007-01  
D.A. Gwaltney and J.M. Briscoe, Marshall Space Flight Center, Marshall Space Flight Center, Alabama
- [Network Management and Configuration Using RMAP](#) [Abstract - Presentation](#)  
ISC 2007-09  
Peter Mendham, Stuart Mills, Steve Parkes,
- [Benchmarking SpW Networks](#) [Abstract - Presentation](#)  
ISC 2007-09  
Asaf Baron, Isask'har Walter, Ran Ginosar, Isaac Keslassy, Ofer Lapid,
- [Integration of Internet Protocols with SpaceWire Using an Efficient Network Broadcast](#) [Abstract - Presentation](#)  
ISC 2007-09  
Robert Klar, Sandra G. Dykes, Allison Bertrand, Christopher C. Mangels,
- [A SpaceWire Implementation of Chainless Boundary Scan Architecture for Embedded Testing](#) [Abstract - Presentation](#)  
ISC 2007-09  
Omar Emam, Mohammed Ali,
- [SpaceWire Hot Modules](#) [Abstract - Presentation](#)  
ISC 2007-09  
Asaf Baron, Isask'har Walter, Ran Ginosar, Isaac Keslassy, Ofer Lapid,
- [SpaceWire Network Topologies](#) [Abstract - Presentation](#)  
ISC 2007-09  
Barry M. Cook, C. Paul H. Walker,
- [The System Approach for a SpaceWire Network](#) [Abstract - Presentation](#)  
ISC 2007-09  
Bruno Masson, Stephane Detheve, Bernard Alison,
- [SpaceWire Network Functional Model](#) [Abstract - Presentation](#)  
ISC 2007-09  
Elena Suvorova, Liudmila Onishchenko, Artur Eganyan,
- [SpaceWire Networks for Payload Applications](#) [Abstract - Presentation](#)  
ISC 2007-09  
Christophe Honvault, Olivier Notebaert,
- Ethernet over SpaceWire – Hardware Issues  
Barry M Cook, Paul Walker



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