TRAFICOM
Finnish Transport and Communications Agency

ESA Artes Tietoliikenneohjelma

03.06.2021 Antti Tyrväinen

4S - Space Systems for Safety and Security

Space Systems for Safety & Security (4S) represents a consolidation of and increase in ESA's efforts to support, under a new ARTES thematic framework:

- European satellite operators and manufacturing industry, to ensure that new levels of security, robustness and resilience become mandatory requirements of space-based communication solutions globally.

- European downstream industry and service providers, in delivering relevant space-based solutions and business models for innovative, economically sustainable downstream services addressing global security needs.

Read more

RELATED CONTENT

- 4S - Govsatcom Precursor
- European quantum communications network takes shape
- Iris - Satcom for Aviation
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- ARTES 4S Announcement of Industrial Opportunity

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Industry Info Session: ARTES 4S Prospects

Opportunity: Space Systems for Safety and Security (4S...

Flight trials for greener aviation set for take off

Opportunity: Pooling and Sharing Interfaces Definition

https://artes.esa.int/4s-space-systems-safety-and-security

3A.136 Integration of satellite and terrestrial railway control networks

ESA/JCB(2020)16, rev.4
Annex III
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- Artes 4S work plan
- ESA open competition ITT
- Funding up to 100%

Activity Ref.	Activity Title	Estimated Price to ESA (kEuro)	Category
3A.136 (4S.006)	Integration of satellite and terrestrial railway control networks	800	B
Objective:	The objective of the activity is to develop and test the control and management protocol stacks of railway control communication via satellite, necessary also for the integration of satellite and terrestrial railway control networks. Testing will be carried out through realistic packet level simulations via a developed software-defined radio testbed.		
Targeted Improvements:	Enabling the use of satellite for railway control communication		
Description:	The European Union Agency for Railways (ERA) and the International Union of Railways (UIC) have started to define the Future Railway Mobile Communication System (FRMCS) as a successor of the current GSM-R system. FRMCS is planned to be operational before GSM-R's predicted saturation in 2030, and SATCOM is identified as a promising component of the future system. The integration of satellite into FRMCS will require developing signalling mechanisms that enable both networks to exchange configuration, management and monitoring information. Hence, this activity will develop the control and management protocol stacks enabling railway control communication via satellite in compliance with FRMCS. Signalling procedures will be defined and tested, including handshaking, registration, call establishments, priority access, handovers, outage detections and reporting. The protocols will be 5G compatible to ensure full integration into the FRMCS railway control services. Multilink capabilities and integration with the user plane will be studied. Packet-level simulation will be carried out to test and evaluate the protocol stacks. A prototype of the control and management protocols will be implemented in a Software Defined Radio (SDR) testbed. End-to end testing will be carried out including integration with the user plane.		
Deliverables:	Summary report, control and management protocol stacks as well as a software defined radio testbed.		
Funding Level	Up to 100%		
Implementing rules	4S GPL AT		
Estimated current TRL:	3		
Target TRL:	4		
Technology harmonised:	No		
Dependency:	No		
S/W Clause:	No		
Service Domain:	5		
Technology Domain:	06 - RF Payload Systems		

ITT avautuu week 29

ARTES 4.0 PLANNED ACTIVITIES SUMMARY TABLE (AT, ScyLight, 4S and 5G/6G)

Activity Ref.	Title	Cost	Classification	Cost (K€) (Baseline)	Cost (K€) (Request)	Proc. Policy	Intended ITT issue quarter / intended ITT issue week	Closing date ITT	ITT (re-)issued	Status comment	originally approved in Work Plan
6C.008	Aircraft detection system for Optical Ground Stations	500	B	500	0	C	Q2 2021				2021
	subtotal	***5,800***		**5,500**	**300**						
	TOTAL (k€)	**31,400**		**28,250**	**3,150**						
	SPACE SYSTEMS FOR SAFETY AND SECURITY (4S)										
	SYSTEM/ NETWORK / PROTOCOLS										
	System, Networking and Management										
3A.136	Integration of satellite and terrestrial railway control networks (4S.006)	800	B	800	0	C	week 29				2021
	subtotal	***800***		**800**	**0**						
	Coding, Modulation and Access										
3C.025	System simulator for UAV terminal development (4S.007)	400	B	400	0	C		22/07/2021	Y		2021
	subtotal	***400***		**400**	**0**						
	Security and Cryptography										
3D.006	Over the air cryptographic keys exchange for secure governmental satellite communications (4S.008)	600	B	600	0	C		11/06/2021	Y		2021
	subtotal	***600***		**600**	**0**						
	GROUND SEGMENT										

Lisätietoa:

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