ISO 15638-20:2020 (E)

Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) — Part 20: Weigh-in-motion monitoring

Contents

	Fore	ord		
	Intro	oduction		
1	Sco	Scope		
2	Nor	Normative references		
3	Terr	Terms and definitions		
4	Sym	Symbols and abbreviated terms		
5	Con	Conformance		
6	General overview and framework requirements			
	6.1	General		
	6.2 6.2.1	Overview of Communication Profile C1 — Remote roadside inspection using a short-range wireless communication interrogator instigating a physical roadside inspection General overview of Communication Profile C1		
	6.2.1.1	Communication Profile C1a— via a hand aimed or temporary roadside mounted and aimed interrogator		
	6.2.1.2	Communication Profile C1b — via a vehicle mounted and directed interrogator		
	6.2.1.3	Communication Profile C1c — via a permanent or semi-permanent roadside or overhead gantry		
	6.3	Overview of Communication Profile 2 — Roadside inspection using a short-range wireless communication interrogator, instigating a download of data to an application service provider		
	6.3.1 6.4	General overview of Communication Profile 2 Overview of Communication Profile C3 — Remote inspection addressed via an ITS- station instigating a download of data to an application service provider via a wireless communications interface (as defined in ISO 15638-2)		
	6.4.1	General overview of Communication Profile C3		
	6.5	Communications requirements		
	6.5.1	General communications requirements		
	6.5.2	Communications profile C1 requirements		
	6.5.3	Communications profile C2 requirements		
	6.5.4	Communications profile C3 requirements		
7	Req	Requirements for services using generic vehicle data		
8	Application services that require data in addition to basic vehicle data			
	8.1	General		
	8.2	Quality of service requirements		
	8.3	Test requirements		
	8.4	Marking, labelling and packaging		
9	Common features of regulated TARV application services			
	9.1	General		
	9.1.1	Communication Profiles C1 and C2		
	9.1.2	Communication Profile C3		
	9.2	Common role of the jurisdiction, approval authority, service provider and user		
	9.3	Common characteristics for instantiations of regulated application services		

	9.4	Common sequence of operations for regulated application services
	9.5	Quality of service
	9.6	Information security
	9.7	Data naming content and quality
	9.8	Software engineering quality systems
	9.9	Quality monitoring station
	9.10	Audits
	9.11	Data access control policy
	9.12	Approval of IVSs and service providers
10	Weigh	n-in-motion (WIM)
	10.1	TARV WIM service description and scope
	10.1.1	Generic TARV WIM use case via the application service provider
	10.1.2	Types of weigh-in-motion
	10.1.3	WIM-O (weigh-in-motion system Onboard)
	10.1.4	WIM-R (weigh-in-motion system Roadway)
	10.1.5	Storage of the WIM data on-board the vehicle
	10.1.6	WIM inspection and Communication Profiles
	10.1.7	Specific use case of weigh-in-motion inspection by an inspector of the jurisdiction
		using short range equipment (Communication profiles 1 and 2)
	10.1.8	Description of TARV WIM regulated application service
	10.1.9	Description of TARV WIM application service
	10.2	Concept of operations for TARV WIM
	10.2.1	General
	10.2.2	Statement of the goals and objectives of the TARV WIM system
	10.2.3	Strategies, tactics, policies, and constraints affecting the TARV WIM system
	10.2.4	Organizations, activities, and interactions among participants and stakeholders of TAR' WIM
	10.2.5	Clear statement of responsibilities and authorities delegated for TARV WIM
	10.2.6	Equipment required for TARV WIM
	10.2.6.1	TARV IVS WIM-0
	10.2.6.2	TARV IVS WIM-R
	10.2.6.3	TARV IVS WIM-O and WIM-R
	10.2.6.4	TARV WIM 'app'
	10.2.7	Operational processes for the TARV WIM system
	10.2.8	Role of the jurisdiction for TARV WIM
	10.2.9	Role of the TARV WIM prime service provider
	10.2.10	Role of the TARV WIM application service provider
	10.2.11	Role of the TARV WIM user
	10.2.12	Generic characteristics for all instantiations of the TARV weigh-in-motion (WIM)
	40.0	application service
	10.3	Sequence of operations for TARV WIM
	10.3.1 10.4	General TARY MIM convice elements
	10.4	TARV WIM service elements TARV WIM service element (SE) 1 — Establish 'weigh-in-motion' regulations,
	10.4.1	requirements, and approval arrangements
	10.4.2	TARV WIM SE2 — Request system approval
	10.4.2	TARV WIM SE2 — Request system approval TARV WIM SE3 — User (fleet owner) contracts with prime service provider
	10.4.4	TARV WIM SE4 — User (fleet owner) equips vehicle with a weigh-in-motion system
	10.4.5	TARV WIM SE5 — User contracts with application service provider
	10.4.6	TARV WIM SE6 — Application service provider uploads software into the TARV
		equipped vehicles of the fleet owner
	10.4.7	TARV WIM SE7 — Create Data
	10.4.8	TARV WIM SE8 — Recording of weigh-in-motion data
	10.4.9	TARV WIM SE10 — 'Interrogated' request for weigh-in-motion data
	10.4.9.1	Communication Profile 1 (via short range mobile interrogator)
	10.4.9.2	Communication Profile 2 (Via Short range mobile interrogator/ISO 15638-2 provision of data)
	10.4.9.3	Communication Profile 3 (Via ISO 15638-2 ITS-station provision of data)
	10.4.10	TARV WIM SE9 — Pre-programmed interval sending weigh-in-motion data to application service provider (Communication Profile 3)
	10.4.11	TARV WIM SE11 — End of session
	10.4.11	Generic TARV WIM data naming, content and quality
	10.5	WIM data content

1	10.7 10.8 10.9	TARV WIM application service specific provisions for quality of service TARV WIM application service specific provisions for test requirements TARV WIM application specific rules for the approval of IVSs and 'Service Providers'
Annex	A (inform	native) WIM communication and transaction profiles
	A.1 A.2	Communication Profiles Communication Profile 1 — Interrogated request for weigh-in-motion data using short range 5,8 GHz DSRC communication
A	A.3	Communication Profile 2 — Roadside inspection using a short-range wireless communication interrogator, instigating a download of data to an application service provider via an ITS-station
A	A.4	Communication Profile 3 — Remote inspection addressed via an ITS-station instigating a download of data to an application service provider via a wireless communications interface
	A.4.2	Obtaining weigh-in-motion data by remotely addressing the IPv6/IPv4 address of a vehicle ITS-station or its weigh-in-motion system that is wirelessly connected in accordance with one or more of the wireless media specified in ISO 15638-2.
,	A.4.3	Obtaining weigh-in-motion data by interrogating via a fixed gantry or roadside beacon is wirelessly connected in accordance with one or more of the wireless media specified in ISO 15638-2.
	4.5 4.5.1 4.6	Pre-programmed downloads of weigh-in-motion data (Communication Profile 3) Pre-programmed interval sending weigh-in-motion data to application service provider. End of session
Annex		ative) Communication Profile for 5,8 GHz DSRC communications
E	B.1	Overview and context
E	B.1.1	Overview
	B.1.2	Use cases
	B.1.3	Physical layer
	B.1.4	Profile 1 transactions
	B.1.5	Profile 1 transactions operating within EN 600 374-1, 5,8 GHz DSRC
	B.1.6	Operating context
	B.1.6.1	Prerequisites
	B.1.6.2	Location constraints
	B.1.6.3	Frames
	B.1.6.4	Information security
	B.1.6.5	WIM LPDU
	B.1.6.6	Equipment design
· -	B.1.6.7	Interrogator form factor IVS form factor
	B.1.6.8 B.1.6.9	
	B.1.6.10	Interrogator antenna form factor IVS antenna form factor
	B.1.6.10	IVS antenna position
	B.1.7	Data retrieval protocol
	B.1.7.1	Overview
	B.1.7.2	Automatically repeating interrogations
	B.1.7.3	WIM operating in a multi-service environment
	B.1.7.4	Commands
	B.1.7.5	Interrogation command sequence
E	B.1.8	Data structures
E	B.1.9	ASN.1 module for the WIM DSRC transaction
E	B.1.9.1	Window management
	B.1.9.1.1	General
		Example of frame exchange
	B.1.9.1.3	
E	B.1.9.1.3.1	MA-DATA.request
		MA-DATA.indication
	B.1.9.2	Behaviour of the IVS
	B.1.9.3	State transitions
	B.1.9.3.1	General
		'Wait for frame'
	B.1.9.3.3	'Validate Frame/Start Timer3 (T3)'
	B.1.9.3.4	'Test frame type' state
E	B.1.9.3.5	'Start Timer 5 (T5)/Call the MA-DATA-ind'

	B.1.9.3.6	'Start Timer4b (T4b)'
	B.1.9.3.7	Private window allocation
	B.1.9.3.8	'Start Timers4a, 5 (T4a, T5)
	B.1.9.3.9	
	B.2	5,8 GHz DSRC functions for weigh-in-motion
	B.2.1	Functions in detail
	B.2.1.1	General
	B.2.1.2	Security and encryption
	B.2.1.3	Creating and maintaining data
	B.2.1.4	Initialise communication
	B.2.1.5	Data transfer mechanism
	B.2.1.6	WIM Transaction to obtain data
	B.3	Error handling
	B.3.1	Recording of the data in the IVS
	B.3.2	Communication errors
	B.3.3	Encryption and signature errors
	B.3.4	Recording of errors
	B.3.4.1	Dynamic wireless communication
	B.3.4.2	Recommendation to use digital imaging in support of DSRC
	B.3.4.3	Failure to read
	B.4 B.4.1	Commissioning and periodic inspection tests for the DSRC
	B.4.1 B.4.2	General Tests which validate data content
	B.4.2 B.4.3	
	B.4.3 B.5	ECHO Data transfer between the IVS-DSRC and VU remote communication
	B.5.1	
	B.5.2	Physical connection and interfaces
	B.5.3	Application protocol Error handling
	B.5.3.1	Recording and communication of the Data in the IVS-DSRC
	B.5.3.1	Wireless communication errors
	B.5.3.3	Encryption and signature errors
	B.5.3.4	Recording of errors
	B.6	Commissioning and periodic inspection tests for the DSRC
	B.6.1	General
	B.6.2	ECHO
_		
Annex	C (inform	mative) Example application data 'profiles' for 'weigh-in-motion'
	C.1	Profile 15638-20-1 — General locally specified WIM transaction
	C.1.1	Generic WIMdata transaction
	C.2	Generic TARV WIM data naming, content and quality
	C.3	Profile 15638-20-2 — DIRECTIVE (EU) 2015/719 (maximum authorized dimensions in
		national and international traffic and the maximum authorized weights in international
		traffic) Remote interrogation data concept: from on-board weigh-in-motion sensors or
		via in-road weigh-in-motion systems
	C.3.1	General
	C.3.2	WIM Data concept overview
	C.3.3	Payload data definition
	C.3.3.1	General
	C.3.3.2	Payload structured record
	C.3.3.3	IVS-DSRC VU payload data
	C.4	Profile 15638-20-3 — WIMRS15638Data
	C.4.1	General
	C.4.2	Payload data definition
	C.4.2.1	General
	C.4.2.2	Payload structured record
	C.4.2.3	WIM payload data (interrogation and WIM-R upload)
	C.4.2.4	Elements of Wim-O/WIM-R Data, actions performed and definitions
	C.4.2.5	Data transfer mechanism
	C.4.2.6	WIM-R data payload for transfer from roadside weigh station to IVS IVS-DSRC
Annex	D (inform	mative) End user considerations for deployment and use of 'weigh-in-motion' systems
	D.1	Weigh-in-motion systems for enforcement
	D.2	Weigh-in-motion performance standards
	D 3	Compliance with processing of personal data

- D.4
- Tachograph integration with weigh in motion and data security Options for expansion of service elements and WIM data content D.5

Page count: 106