

EPC id	EPC Identifier	GS1 Voc class	id prop	extra prop	schema.org class (advised AI)	AI qualifier	comment
GTIN	Global Trade Item Number	gs1:Product	gs1:gtin		schema:Product	01	class of products, goods or services; eg Can of soup, chocolate bar, music album
LGTN	Batch/Lot + Global Trade Item Number	gs1:ProductBatch	gs1:gtin	gs1:hasBatchLotNumber		01 10	batch or lot of same-class products
SGTN	Serialized Global Trade Item Number	gs1:IndividualProduct	gs1:gtin		schema:IndividualProduct	01 21	individual product with serial number
UPUI	Unit Pack Identifier	gs1:IndividualProduct		gs1:hasThirdPartySerialNumber	schema:IndividualProduct	01 235	individual product with third-party controlled serial
ITIP	Individual Trade Item Piece	gs1:IndividualTradeItemPiece				8006 21	
CPI	Component / Part Identifier	gs1:Component				8010 8011	part number in technical industries, eg automotive
GDTI	Global Document Type Identifier	gs1:Document			foaf:Document, schema:Cri	253	document instance or document type: Tax demands, shipment forms, driving licences
SGCN	Serialized Global Coupon Number	gs1:Coupon				255	A discount or promotional coupon
GIAI	Global Individual Asset Identifier	gs1:IndividualAsset				8004	already an instance identifier
GRAI	Global Returnable Asset Identifier	gs1:ReturnableAsset				8003	if length > 14, an instance identifier
SSCC	Serial Shipping Container Code	gs1:LogisticsUnit				00	already an instance identifier
GINC	Global Identification Number for Consignment	gs1:Consignment				403	Logistics units transported together in an ocean container. Is this grouping of physical objects also a physical object? Ask Jaco
GSIN	Global Shipment Identification Number	gs1:Shipment				402	Logistics units delivered to a customer together. Is this grouping of physical objects also a physical object? Ask Jaco
PGLN	Global Location Number of Party	gs1:Organization	gs1:globalLocationNumber		schema:Organization	417	Company or Party
GSRN	Global Service Relation Number - Recipient	gs1:ServiceRecipient				8018	Loyalty scheme members, doctors at a hospital, library members. Maybe move from "What" (EPC) to "Who" section
GSRNP	Global Service Relation Number - Provider	gs1:ServiceProvider				8017	Maybe move from "What" (EPC) to "Who" section
SGLN	Global Location Number With or Without Extension	gs1:Place	gs1:globalLocationNumber			414	254 (optionally) already an instance identifier
GMN	Global Model Number	gs1:ProductModel			schema:ProductModel	8013	abstract class that can be common to several GTIN; doesn't belong in epcl:ist or epc:Class, but could be in the master data for that GTIN. Example: same printer (GMN) with two GTINs for the UK and the EU market (with different electrical plug). Often used for Medical devices
BIC	BIC-Container-Code	gs1:ShippingContainer-2		maybe-need-extra2		na	intermodal-container-in-rail-and-shipping-(ISO-6346)-class-3-identifier-managed-by-another-org-(not-GS1)-has-URN-for-but-no-binary-encoding-Ask-Jaco-and-Craig-where-it-belongs-in-EDIGS-(probably-in-Aggregation-event)
IMOVN	IMO-Vessel-Number	gs1:MarineVessel-2		maybe-need-extra2		na	Marine-vessel-number-managed-by-IMO-Class-3-identifier-managed-by-another-org-(not-GS1)-has-URN-for-but-no-binary-encoding-Ask-Jaco-and-Craig-where-it-belongs-in-EDIGS-(probably-in-Aggregation-event)
SRIN	Service-Relation-Instance-Number	gs1:ServiceInstance					instance-of-interaction-between-a-service-provider-and-service-recipient-(eg-doctor-in-vet-or-medicine-dispensation)-Does-it-belong-in-EDIGS?
GID	Generic-Identifier	gs1:IndividualObject		maybe-need-extra2			Legacy-product-identifier-replaced-by-GTIN-some-automotive-industries-still-use-it
ADI	Aerospace-and-Defense-Identifier	gs1:Component		maybe-need-extra2			Aircraft/aerospace-components/parts
USDOD	US-Department-of-Defense-Identifier	gs1:IndividualObject		maybe-need-extra2			

level1	level2	level3	comment	let's first agree the hierarchy as indented levels, then make class-superclass statements
gs1:IndividualObject			physical object (eg product, container, paper document) or digital object (download, ebook, digital document, digital coupon)	
	gs1:IndividualProduct		every SGTIN is instance of the class of its corresponding GTIN, as well as instance of gs1:IndividualProduct	
	gs1:IndividualTradeItemPiece			
	gs1:Component			
	gs1:Document			
		epcis:EPCISDocument		
		epcis: BizTransaction		
		gs1: Coupon		
		gs1: CertificationDetails ?		
	gs1:IndividualAsset			
		gs1: MarineVessel ?	Maybe move it out 1 level, because we want all IndividualAsset to have GIAI, while MarineVessel has IMOVN	
	gs1:ReturnableAsset			
		gs1: ShippingContainer ?	Maybe move it 1 level out, because we want all ReturnableAssets to have GRAI, but Container has BIC	
	gs1:LogisticUnit			
	gs1:Consignment			
	gs1:Shipment			
	gs1:SensorDevice		can be IndividualAsset (GIAI) or IndividualProduct (SGTIN), so will carry 2 classes	
gs1:Product				
gs1:ProductBatch				
gs1:ProductModel				
gs1:Place				
gs1:Organization				
	gs1:ServiceRecipient		MGH: In many cases, the recipient is an instance of a schema:Person rather than a gs1:Organization	
	gs1:ServiceProvider			
epcis:SourceOrDestination			gs1:Place or gs1:Organization, plus sourceOrDestinationType explaining its role in a transfer	
gs1:ServiceInstance				
epcis:EPCISEvent				
	epcis:AggregationEvent			
	epcis:AssociationEvent			
	epcis:ObjectEvent			
	epcis:TransactionEvent			
	epcis:TransformationEvent			
epcis:ErrorDeclaration			declares an event as erroneous, and optionally points to correctiveEvents	
epcis:EPCISDocument			Not in UML diagram, but we will include it in RDF diagram	
epcis:EPCISDocumentBody			Not in UML diagram, but we will include it in RDF diagram	
epcis:SensorElement			one SensorMetadata, and many sensorReports	
epcis:SensorMetadata			relatively static sensor metadata, same for a group of SensorReports	
epcis:SensorReport			sensor data that varies per reading	
epcis:QuantityElement			epcisClass, plus quantity and uom (unit of measure)	
epcis:PersistentDisposition			collection of "set" and "unset" operations of Dispositions	
epcis:ILMD			instance/lot master data	
cbv: BizStep			nomenclature	
cbv: Comp			nomenclature: component in SensorReport	
cbv: Disp			nomenclature	
cbv: SDT			nomenclature: sourceOrDestinationType in SourceOrDestination	
cbv: BTT			nomenclature: bizTransactionType in BizTransaction	
cbv: ER			nomenclature: "reason" in ErrorDeclaration	
gs1: MeasurementType			nomenclature: measureType in SensorReport	

property	domains	ranges	inverse name	status	change needed
epcis:bizStep	epcis:EPCISEvent	cbv: BizStep	event	done	cbv: BizStep
epcis:bizTransactionType	epcis: BizTransaction	cbv: BTT	bizTransaction	ok	
epcis:component	epcis: SensorReport	cbv: Comp	sensorReport	done	cbv: Comp
epcis:disposition	epcis: EPCISEvent	cbv: Disp	event	done	cbv: Disp
epcis:set	epcis: PersistentDisposition	cbv: Disp	dispToSet	done	cbv: Disp
epcis:unset	epcis: PersistentDisposition	cbv: Disp	dispToUnset	done	cbv: Disp
epcis:reason	epcis: ErrorDeclaration	cbv: ER	errorDeclaration	done	cbv: ER
epcis:sourceOrDestinationType	epcis: SourceOrDestination	cbv: SDT	sourceOrDestination	ok	
epcis:bizTransactionList	epcis: EPCISEvent	epcis: BizTransaction	event	ok	
epcis:epcisBody	epcis: EPCISDocument	epcis: EPCISDocumentBody	document	done	
epcis:correctiveEventIds	epcis: ErrorDeclaration	epcis: EPCISEvent	errorDeclaration	done	epcis: EPCISEvent
epcis:eventList	epcis: EPCISDocumentBody	epcis: EPCISEvent	documentBody	done	change domain to EPCISDocumentBody. change prop; add domain class
epcis:errorDeclaration	epcis: EPCISEvent	epcis: ErrorDeclaration	event	ok	
epcis:ilmid	epcis: ObjectEvent, epcis: TransformationEvent	epcis: ILMID	event	ok	
epcis:persistentDisposition	epcis: EPCISEvent	epcis: PersistentDisposition	event	ok	
epcis:childQuantityList	epcis: AggregationEvent, epcis: AssociationEvent	epcis: QuantityElement	eventWithChildQuantity	ok	
epcis:inputQuantityList	epcis: TransformationEvent	epcis: QuantityElement	eventWithInputQuantity	ok	
epcis:outputQuantityList	epcis: TransformationEvent	epcis: QuantityElement	eventWithOutputQuantity	ok	
epcis:quantityList	epcis: ObjectEvent, epcis: TransactionEvent	epcis: QuantityElement	eventWithQuantity	ok	
epcis:sensorElementList	epcis: EPCISEvent	epcis: SensorElement	event	done	missing, object property
epcis:sensorMetadata	epcis: SensorElement	epcis: SensorMetadata	sensorElement	ok	
epcis:sensorReport	epcis: SensorElement	epcis: SensorReport	sensorElement	ok	
epcis:destinationList	epcis: EPCISEvent	epcis: SourceOrDestination	eventWithDestination	ok	
epcis:sourceList	epcis: EPCISEvent	epcis: SourceOrDestination	eventWithSource	ok	
epcis:transformationID	epcis: TransformationEvent	epcis: Transformation	event	done	object property, now has range epcis: Transformation
epcis:certification	epcis: EPCISEvent	gs1: CertificationDetails	event	todo	"info" or "details"?
epcis:childEPCs	epcis: AggregationEvent, epcis: AssociationEvent	gs1: IndividualObject	eventWithChildEPC	done	gs1: IndividualObject
epcis:epcList	epcis: ObjectEvent, epcis: TransactionEvent	gs1: IndividualObject	eventWithEPC	done	gs1: IndividualObject
epcis:inputEPCList	epcis: TransformationEvent	gs1: IndividualObject	eventWithInputEPC	done	gs1: IndividualObject (not gs1: Product, gs1: ProductBatch: these are in inputQuantityList)
epcis:outputEPCList	epcis: TransformationEvent	gs1: IndividualObject	eventWithOutputEPC	done	gs1: IndividualObject (not gs1: Product, gs1: ProductBatch)
epcis:measurementType	epcis: SensorReport	gs1: MeasurementType	sensorReport	ok	
epcis:bizLocation	epcis: EPCISEvent	gs1: Place	eventWithBizLocation	done	range is gs1: Place, now delete class BizLocation
epcis:readPoint	epcis: EPCISEvent	gs1: Place	eventWithReadPoint	done	range is gs1: Place, now delete class ReadPoint
epcis:parentID	epcis: AggregationEvent, epcis: AssociationEvent, epcis: TransformationEvent	gs1: Place, gs1: IndividualObject	eventWithThisParent	done	gs1: IndividualObject, gs1: Place
epcis:destination	epcis: SourceOrDestination	gs1: Place, gs1: Organization	sourceOrDestination	todo	
epcis:source	epcis: SourceOrDestination	gs1: Place, gs1: Organization	sourceOrDestination	todo	
epcis:epcClass	epcis: QuantityElement	gs1: Product, gs1: ProductBatch	quantityElement	todo	
epcis:deviceId	epcis: SensorMetadata, epcis: SensorReport	gs1: SensorDevice	quantityElement	done	gs1: SensorDevice
epcis:booleanValue	epcis: SensorReport	xsd: boolean	n/a	ok	
epcis:declarationTime	epcis: ErrorDeclaration	xsd: dateTimeStamp	n/a	ok	
epcis:endTime	epcis: SensorMetadata	xsd: dateTimeStamp	n/a	ok	
epcis:eventTime	epcis: EPCISEvent	xsd: dateTimeStamp	n/a	ok	
epcis:recordTime	epcis: EPCISEvent	xsd: dateTimeStamp	n/a	ok	
epcis:startTime	epcis: SensorMetadata	xsd: dateTimeStamp	n/a	ok	
epcis:time	epcis: SensorMetadata, epcis: SensorReport	xsd: dateTimeStamp	n/a	ok	
epcis:maxValue	epcis: SensorReport	xsd: double	n/a	ok	
epcis:meanValue	epcis: SensorReport	xsd: double	n/a	ok	
epcis:minValue	epcis: SensorReport	xsd: double	n/a	ok	
epcis:percRank	epcis: SensorReport	xsd: double	n/a	done	xsd: double
epcis:percValue	epcis: SensorReport	xsd: double	n/a	done	xsd: double
epcis:quantity	epcis: QuantityElement	xsd: double	n/a	done	
epcis:sDev	epcis: SensorReport	xsd: double	n/a	ok	
epcis:value	epcis: SensorReport	xsd: double	n/a	ok	
epcis:hexBinaryValue	epcis: SensorReport	xsd: hexBinary	n/a	ok	
epcis:action	epcis: AggregationEvent, epcis: AssociationEvent, epcis: TransformationEvent	xsd: string	n/a	ok	
epcis:eventTimeZoneOffset	epcis: EPCISEvent	xsd: string	n/a	ok	
epcis:stringValue	epcis: SensorReport	xsd: string	n/a	ok	
epcis:uom	epcis: QuantityElement, epcis: SensorReport	xsd: string	n/a	done	
epcis:bizRules	epcis: SensorMetadata		n/a	done	object property, no range
epcis:chemicalSubstance	epcis: SensorReport		n/a	done	object property, no range
epcis:coordinateReferenceSystem	epcis: SensorReport		n/a	done	object property, no range
epcis:dataProcessingMethod	epcis: SensorMetadata, epcis: SensorReport		n/a	done	object property, no range
epcis:deviceMetadata	epcis: SensorMetadata, epcis: SensorReport		n/a	done	object property, no range
epcis:microorganism	epcis: SensorReport		n/a	ok	object property, no range
epcis:rawData	epcis: SensorMetadata, epcis: SensorReport		n/a	ok	object property, no range
epcis:urlValue	epcis: SensorReport		n/a	done	object property, no range
	<b>External prop</b>				
gs1:certificationSubject	gs1: CertificationDetails	gs1: IndividualObject, gs1: Organization, gs1: Place, gs1: Product, gs1: ProductBatch, gs1: ProductModel	n/a	todo	is the range union correct?
	<b>Deleted pseudo props</b>				
epcis:eventID	epcis: EPCISEvent	xsd: anyURI		done	pseudo-prop, delete. Also, the classes are wrong (should be gs1: Place)
epcis:bizTransaction	epcis: BizTransaction	xsd: anyURI		done	pseudo-prop, delete.
epcis:id	epcis: BizLocation, epcis: ReadPoint	xsd: anyURI		done	pseudo-prop, delete. Also, the classes are wrong (should be gs1: Place)

<a href="#">EPC Tag Data Standard, version 1.13, GS1, Nov 2019.</a>					
<a href="#">As transcribed in Wikipedia Electronic_Product_Code#All_GS1_Identification_Keys, Vladimir Alexiev, Feb 2021</a>					
<a href="#">GS1 Digital Link: Semantics, GS1, To Be 1.2, Draft 0.5, 23 November 2020</a>					
Table 3.1					
Table classSemantics					
Sec 3.9					
<a href="https://github.com/gs1/EPCIS/issues/451">https://github.com/gs1/EPCIS/issues/451</a>	track implementation status in gs1 Voc				