S-100 – Part 2c

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Portrayal Register

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2c-1 Scope

The IHO Geospatial Information (GI) Registry contains a number of Registers, one of which will be for portrayal. The Portrayal Register registers the components used to build Portrayal Catalogues. When provided with a Feature Catalogue and compliant data, a Portrayal Catalogue built from registered components transforms features and attributes into a portrayal.

The portrayal of data is independent of the data but closely related to the data. That is, the attributes within the data set drive the portrayal process, but there may be many different portrayals for the same data.

The use of a Register to store portrayal components improves the IHO's ability to manage and extend the portrayal of products based on S-100. This Register supports wider use of registered items by making them publicly available and increasing their visibility to Portrayal Catalogue developers. This Part describes the content of the Portrayal Register.

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2c-1.1 Conformance

This profile conforms to conformance class 2 of ISO 19106:2004.

2c-2 Normative references

The following referenced documents are required for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

ISO 19135:2005, *Geographic Information – Procedures for registration of items of geographic information*

ISO 19126:2009, *Geographic Information – Feature concept dictionaries and registers*

ISO 19117:2012, *Geographic Information – Portrayal*

2c-3 General concepts

2c-3.1 Register

As described in Part 2, a Register is simply a managed list. It is easier to maintain than a fixed document, because new items can be added as needed to the Register, and existing items in the Register can be clarified, superseded or retired. Each Register item has one or more dates associated with it that indicate when changes in its status occurred. This means that a Product Specification, defined at a given date, may reference an item in the Register at that specific point in time.

2c-3.2 Portrayal Register

The Portrayal Register specifies the independent sets of components used to build Portrayal Catalogues such as colours, symbols, and fonts. The Register also specifies supporting items such as context parameters, viewing groups, display planes and the components used within an optional Alerts Catalogue.

The Portrayal Register may be subdivided into different Domains; and may be used to develop a Portrayal Catalogue. Unlike a Portrayal Catalogue, the Portrayal Register does not define the portrayal rules or bind the portrayal or alerts/indications to a feature.

Such registers of portrayal information may serve as sources of reference for similar Registers established by other geographic information communities as part of a system of cross-referencing.

2c-3.3 Portrayal catalogue

The Portrayal Catalogue contains portrayal rules that map the features to symbology; and optionally to alerts/indications. It also contains symbol definitions, colour definitions, portrayal parameters and portrayal management concepts. Portrayal Catalogues are described in detail in S-100 Part 9.

2c-4 IHO Portrayal Register

2c-4.1 Types of registered items

The following are types of items that may be registered:

1) Pixmap
2) Colour Value
3) Colour Token
4) Colour Palette
5) Symbol
6) Line Style
7) Area Fill
8) Font
9) Viewing Group
10) Viewing Group Layer
11) Display Mode
12) Display Plane
13) Context Parameter

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14) Symbol Schema
15) Line Style Schema
16) Area Fill Schema
17) Pixmap Schema
18) Colour Profile Schema
19) Drawing Priority
20) Alert
21) Alert Message
22) Alert Highlight

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2c-4.2 Data model of a Portrayal Register

2c-4.2.1 UML Model

Figures 2c-1 and 2c-2 show the register management and information models respectively of the hydrographic Portrayal Register:

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Figure 2c-1 – Portrayal Register management model

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Figure 2c-2 – Portrayal Register information model

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2c-4.2.2 S100_PR_Register

This class S100_PR_Register is a specialization of the class S100_RE_Register. It is extended with an 'owner' and 'domain'. An organization may have a dedicated Register and a Register is intended for a specific Domain.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_Register	Portrayal Register extension to S100_RE_Register	-	S100_RE_Register	Inherits all characteristics of S100_RE_RegisterItem and extended with domain and owner
Association	owner	The organization responsible for managing the contents of the Register	1	S100_PR_RegisterOrganization	
Association	domain	The domain for which the Register is primarily intended	1	S100_PR_RegisterDomain	

2c-4.2.3 S100_PR_RegisterDomain

This class indicates the Domain for which a Register is intended.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterDomain	Definition of a Domain	-	-	
Attribute	name	Name of Domain	1	CharacterString	
Attribute	description	Description of Domain	1	CharacterString	

2c-4.2.4 S100_PR_User

This class represents a user of the Register.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterUser	Identification of a Register user	-	-	
Attribute	firstName	First name of user	1	CharacterString	
Attribute	lastName	Last name of user	1	CharacterString	
Attribute	creationDate	Date user was entered	1	Date	

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Role Name	Name	Description	Mult	Data Type	Remarks
Attribute	email	Email of user	1	CharacterString	
Association	organization	Reference to organization	1	S100_PR_RegisterOrganization	

2c-4.2.5 S100_PR_RegisterManager

This class identifies a Register Manager along with current status and time period.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterManager	Indicates the manager of a Register	-	-	
Attribute	startDate	The start date of the manager	1	Date	
Attribute	endDate	The date on which the manager duties end	0..1	Date	
Attribute	active	Flag if manager is currently active	1	Boolean	
Association	register	The Register that the manager manages	1	S100_PR_Register	
Association	user	The user that is the manager	1	S100_PR_User	

2c-4.2.6 S100_PR_RegisterOrganization

This class represents a Register Organization.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterOrganization	Definition of a Register Organization	-	-	
Attribute	shortName	Abbreviated or simple form name	1	CharacterString	
Attribute	fullName	Full name of organization	1	CharacterString	

2c-4.2.7 S100_PR_RegisterPermissions

A class used to assign permissions to a Register user.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterPermissions	Register user permissions	-	-	

Role Name	Name	Description	Mult	Data Type	Remarks
Attribute	read	Permission to read Register entries	1	Boolean	
Attribute	write	Permission to write Register entries	1	Boolean	
Attribute	controlBody	User is Control Body	1	Boolean	Part 2 Management of Registers
Association	register	The Register that the manager manages	1	S100_PR_Register	
Association	user	The user that is the manager	1	S100_PR_User	

2c-4.2.8 S100_PR_ ManagementInfo

This class is a portrayal extension of the S100_RE_ManagementInfo class with a reference to an Organization object and possible attachments.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ManagementInfo	Extension of S100_RE_ManagementInfo	-	S100_RE_ManagementInfo	
Association	organization	Organization submitting Register entries	1	S100_PR_RegisterOrganization	
Association	attachment	Attached file or files	0..*	S100_PR_Attachment	

2c-4.2.9 S100_PR_ Attachment

This class handles attachments.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ Attachment	Holds an attached file	-	-	
Attribute	name	Name of attachment	1	CharacterString	
Attribute	type	Type of attachment	1	S100_PR_FileType	
Attribute	file	The attachment	1	Blob	

2c-4.2.10 S100_PR_ RegisterItem

The class S100_PR_RegisterItem is a specialization of the class S100_RE_RegisterItem which carries a valid XML identifier to be used in a Portrayal Catalogue.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_RegisterItem	Extension of S100_RE_RegisterItem	-	S100_RE_RegisterItem	
Attribute	xmlID	Valid XML identifier string	1	CharacterString	
Attribute	description	Description in a national language	0..*	S100_PR_NationalLanguageString	Provides S100_RE_RegisterItem definition attribute in alternate languages, supporting population of Portrayal Catalogue language-independent descriptions

2c-4.2.11 S100_PR_ VisualItem

An abstract specialization of S100_PR_RegisterItem to represent 'symbol', 'lineStyle', 'areaFill' or 'pixmap'. The visual items each have an XML identifier string and XML document defining the item details as well as a preview image and an engineering image with dimensions.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_VisualItem	Abstract class representing a graphic element such as a symbol or linestyle	-	S100_PR_ RegisterItem	
Attribute	itemDetail	The XML file of the item	0..1	Blob	
Attribute	previewImage	A preview image of the item	0..1	Blob	
Attribute	engineeringImage	The engineering image with measurements	0..1	Blob	
Attribute	previewType	The file type of the preview image	0..1	S100_PR_ImageType	Required if previewImage is populated
Attribute	engineeringImageType	The file type of the engineering image	0..1	S100_PR_ImageType	Required if engineeringImage is populated
Association	itemSchema	The XML schema to validate the item	1	S100_PR_ItemSchema	
Association	colourToken	The colour tokens used by the visual item	0..*	S100_PR_ColourToken	Needed to identify dependencies when assembling a Portrayal Catalogue

2c-4.2.12 S100_PR_ Symbol

The class S100_PR_Symbol is a specialization of the class S100_PR_VisualItem used to register a symbol according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_Symbol	Symbol visual item	-	S100_PR_VisualItem	

2c-4.2.13 S100_PR_ LineStyle

The class S100_PR_LineStyle is a specialization of the class S100_PR_VisualItem used to register a linestyle according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_LineStyle	Line style visual item	-	S100_PR_VisualItem	
Association	symbol	Symbols used by the line style	0..*	S100_PR_ Symbol	Used to identify dependencies

2c-4.2.14 S100_PR_ AreaFill

The class S100_PR_AreaFill is a specialization of the class S100_PR_VisualItem used to register an area fill according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_AreaFill	Area fill visual item	-	S100_PR_VisualItem	
Association	symbol	Symbols used by the area fill	0..*	S100_PR_ Symbol	Used to identify dependencies

2c-4.2.15 S100_PR_ Pixmap

The class S100_PR_Pixmap is a specialization of the class S100_PR_VisualItem used to register a pixmap according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_Pixmap	Pixmap visual item	-	S100_PR_VisualItem	

2c-4.2.16 S100_PR_ ItemSchema

The class S100_PR_ItemSchema is a specialization of the class S100_PR_RegisterItem used to register a portrayal item schema according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ItemSchema	Schema of an XML portrayal item	-	S100_PR_RegisterItem	
Attribute	XMLSchema	The XML schema stored as a Blob	1	Blob	Schema from Part 9 Portrayal

2c-4.2.17 S100_PR_ColourToken

The class S100_PR_ColourToken is a specialization of the class S100_PR_RegisterItem. A color token defines a single reference for multiple color values, each of which is associated with a single colour palette.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ColourToken	Definition of a colour token	-	S100_PR_RegisterItem	
Attribute	token	Identifier of the colour value(s)	1	CharacterString	
Association	value	The colour(s) associated with this token	1..*	S100_PR_PaletteItem	Used to identify dependencies Multiplicity if intended for use by ECDIS is 3..*

2c-4.2.18 S100_PR_ColourPalette

The class S100_PR_ColourPalette is a specialization of the class S100_PR_RegisterItem.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ColourPalette	Definition of a colour palette	-	S100_PR_RegisterItem	

2c-4.2.19 S100_PR_PaletteItem

The class S100_PR_PaletteItem is a specialization of the class S100_PR_RegisterItem. It provides a colour value for colour tokens within a colour palette.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_PaletteItem	Definition of a colour palette entry	-	S100_PR_RegisterItem	
Attribute	transparency	Transparency	0..1	Real	Range is [0, 1], default is 0 (opaque)
Attribute	colour	The colour value	1	S100_PR_ColourValue	

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The preview_sRGB is just used by the Portrayal Register and Catalogue Builder to give a sample of what the colour looks like. The actual colour value used for portrayal depends on the active colour palette

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Association	palette	The palette(s) associated with this item	1..*	S100_PR_ColourPalette	Used to identify dependencies

2c-4.2.20 S100_PR_DisplayMode

This is a specialization of the class S100_PR_RegisterItem used to register a Display Mode according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_DisplayMode	Used to register a Display Mode	-	S100_PR_RegisterItem	See Part 9 Portrayal

2c-4.2.21 S100_PR_ViewingGroupLayer

This is a specialization of the class S100_PR_RegisterItem used to register a Viewing Group Layer according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ViewingGroupLayer	Used to register a Viewing Group Layer	-	S100_PR_RegisterItem	See Part 9 Portrayal
Association	displayMode	A display mode which may include this layer	0..*	S100_PR_DisplayMode	Used to identify dependencies

2c-4.2.22 S100_PR_ViewingGroup

This is a specialization of the class S100_PR_RegisterItem used to register a Viewing Group according to Part 9 Portrayal.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_ViewingGroup	Used to register a Viewing Group	-	S100_PR_RegisterItem	See Part 9 Portrayal
Attribute	foundationMode	Indicates the viewing group should always be on.	0..1	Boolean	Default is false
Association	viewingGroupLayer	A viewing group layer which may include this viewing group	0..*	S100_PR_ViewingGroupLayer	Used to identify dependencies

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The class S100_PR_ColourProfile is a specialization of the class S100_PR_RegisterItem.

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2c-4.2.23 S100_PR_DisplayPlane

This is a specialization of the class S100_PR_RegisterItem.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_DisplayPlane	The specific content for a display plane definition as a register item of type 'displayPlane'	-	S100_PR_RegisterItem	See Part 9 Portrayal
Attribute	Order	Used to sort the drawing order of display planes	1	Integer	

2c-4.2.24 S100_PR_Font

This is a specialization of S100_PR_RegisterItem. Used to register a font file for use in a Portrayal Catalogue.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_Font	The specific content for a font file definition as a register item of type 'font'	-	S100_PR_RegisterItem	See Part 9 Portrayal
Attribute	fontFile	A font file for inclusion in a portrayal catalogue	1	Blob	
Attribute	fontType	The type of font file	1	S100_PR_FontType	Initially restricted to True Type Font

2c-4.2.25 S100_PR_DrawingPriority

S100_PR_DrawingPriority is a specialization of S100_PR_RegisterItem.

Role Name	Name	Description	Mult	Data Type	Remarks
Class	S100_PR_DrawingPriority	Used to register drawing priorities to be used in a Portrayal Catalogue	-	S100_PR_ RegisterItem	See Part 9 Portrayal
Attribute	priority	Used to sort drawing instructions within a display plane	1	Integer	

2c-4.2.26 S100_PR_ContextParameter

S100_PR_ContextParameter is a specialization of S100_PR_RegisterItem.

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Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_ContextParameter	The specific content for a context parameter as a register item of type 'contextParameter'	-	S100_PR_ RegisterItem	See Part 9 Portrayal
Attribute	parameterType	Data type of context parameter	1	S100_PR_ParameterType	
Attribute	defaultValue	Default or initial value	0..1	CharacterString	

2c-4.2.27 S100_PR_ColourValue

Identifies a colour value in one or more colour spaces.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_ColourValue	Describes a colour value in one or more colour spaces	-	-	At least one colour value must be present
Attribute	sRGB	The colour value in the sRGB colour space	0..1	S100_PR_SRGBValue	
Attribute	cie	The colour value in the CIE colour space	0..1	S100_PR_CIEValue	

2c-4.2.28 S100_PR_SRGBValue

Identifies a colour value in the sRGB colour space.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_SRGBValue	A colour value in the sRGB colour space	-	-	
Attribute	red	Amount of red	1	Integer	Range is [0,255]
Attribute	green	Amount of green	1	Integer	Range is [0,255]
Attribute	blue	Amount of blue	1	Integer	Range is [0,255]

2c-4.2.29 S100_PR_CIEValue

Identifies a colour value in the CIE colour space.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_CIEValue	A colour value in the CIE colour space	-	-	

Attribute	x	x component of the chromaticity	1	Real	Range [0,1]
Attribute	y	y component of the chromaticity	1	Real	Range [0,1]
Attribute	L	Luminance in cd/m2	1	Real	

2c-4.2.30 S100_PR_Alert

S100_PR_Alert is a specialization of S100_PR_RegisterItem. An alert is associated with features by Portrayal Catalogue rules.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_Alert	Provides a priority, message, and the viewing groups associated with a graphical highlight.	-	S100_PR_RegisterItem	One of routeMonitor or routePlan must be present
Attribute	routeMonitor	Describes the attributes of the alert during route monitoring	0..*	S100_PR_AlertInfo	
Attribute	routePlan	Describes the attributes of the alert during route planning	0..*	S100_PR_AlertInfo	

2c-4.2.31 S100_PR_AlertInfo

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_AlertInfo	The attributes of an alert	-	-	
Attribute	priority	The priority of the alert	1..*	S100_PR_AlertPriority	Multiplicity supports user selection of priority
Association	msg	A message to display while the alert is active	1	S100_PR_AlertMessage	
Association	highlight	Supports toggling display of the graphical highlight	0..1	S100_PR_AlertHighlight	

2c-4.2.32 S100_PR_AlertPriority

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_AlertPriority	The priority of an alert	-	-	
Attribute	priority	The priority value	1	S100_PR_AlertPriorityType	
Attribute	default	Indicates this priority is the default	0..1	Boolean	Default is false

Attribute	optional	Indicates exposing this priority to the user is optional	0..1	Boolean	Default is false

2c-4.2.33 S100_PR_AlertMessage

S100_PR_AlertMessage is a specialization of S100_PR_RegisterItem. Messages are displayed while any associated alert is active.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_AlertMessage	A message associated with one or more alerts	-	S100_PR_RegisterItem	
Attribute	text	Message in one or more languages	1..*	S100_PR_NationalLanguageString	Message in English must be provided
Association	icon	A symbol to display with or instead of the text.	0..1	S100_PR_Symbol	

2c-4.2.34 S100_PR_AlertHighlight

S100_PR_AlertHighlight is a specialization of S100_PR_RegisterItem. Highlights associate viewing groups with alert information, which allows users to disable graphical highlighting of one or more active S100_PR_Alerts.

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_AlertHighlight	Associates viewing groups with alerts to support user toggling of highlights	-	S100_PR_RegisterItem	
Attribute	optional	Indicates whether allowing the highlight to be turned off is optional	0..1	Boolean	Default is false
Association	viewingGroup	The viewing group(s) associated with an alert highlight (Portrayal Catalogue rules generate the drawing instructions which implement the highlight)	1..*	S100_PR_ViewingGroup	Multiple viewing groups are present to allow highlighting of alerts triggered by specific feature types to be disabled independently For example, ProhibitedAreaHighlight supports disabling highlighting of Seaplane Landing Areas while other prohibited areas continue to be highlighted When multiple viewing groups are provided, consideration should be given to providing a viewing group layer to toggle all the viewing groups at once

Association	msg	A message to display while any of the viewing groups are disabled	0..1	S100_PR_AlertMessage	

2c-4.2.35 S100_PR_NationalLanguageString

Role Name	Name	Description	Mult.	Data Type	Remarks
Class	S100_PR_NationalLanguageString	Text specific to a national language	-	-	
Attribute	text	A string in a national language	1	CharacterString	
Attribute	language	ISO 639-2 3-letter language code	0..1	CharacterString	Default is “eng“

2c-4.2.36 S100_PR_FileType

Role Name	Name	Description	Code	Remarks
Enumeration	S100_PR_FileType	The type and format of a file.	-	
Value	docx	Office Open XML Document	-	Zip and XML-based file format for documents. Not to be confused with OpenOffice format or generic XML
Value	zip	Zip archive format	-	
Value	xlsx	Office Open XML Workbook	-	Zip and XML-based file format for spreadsheets. Not to be confused with OpenOffice format or generic XML

2c-4.2.37 S100_PR_FontType

Role Name	Name	Description	Code	Remarks
Enumeration	S100_PR_FontType	A font specification	-	
Value	ttf	TrueType font	-	

2c-4.2.38 S100_PR_ImageType

Role Name	Name	Description	Code	Remarks
Enumeration	S100_PR_ImageType	An image specification	-	
Value	jpg	JPEG 2000 image coding system	-	
Value	png	Portable Network Graphics format	-	
Value	tif	Tagged Image File Format	-	

2c-4.2.39 S100_PR_AlertPriorityType

Role Name	Name	Description	Code	Remarks
Enumeration	S100_PR_AlertPriorityType	Defines the possible priorities for an alert.	-	
Value	alarm	Indicates conditions requiring immediate attention and action by the bridge team	-	From MSC.252(83) 19.1.2
Value	warning	Indicates changed conditions and should be presented for precautionary reasons which are not immediately hazardous but which may become so, if no action is taken	-	From MSC.252(83) 19.1.3
Value	caution	Indicates a condition which does not warrant an alarm or warning condition, but still requires attention and out of the ordinary consideration of the situation or of given information	-	From MSC.252(83) 19.1.4
Value	indication	Display of regular information and conditions	-	From MSC.252(83) appendix 1

2c-4.2.40 S100_PR_ParameterType

The definition and members of enumeration S100_PR_ParameterType are the same as ParameterType in Part 9, clause 9-13.3.25.

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