Florida Department of Transportation

DISTRICTWIDE ITS SOFTWARE SUPPORT SERVICES ROAD RANGER MOBILE APPLICATION (RRMA) R2.0 INTERFACE CONTROL DOCUMENT (ICD)

ICD - VERSION 1.2

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DOCUMENT CONTROL

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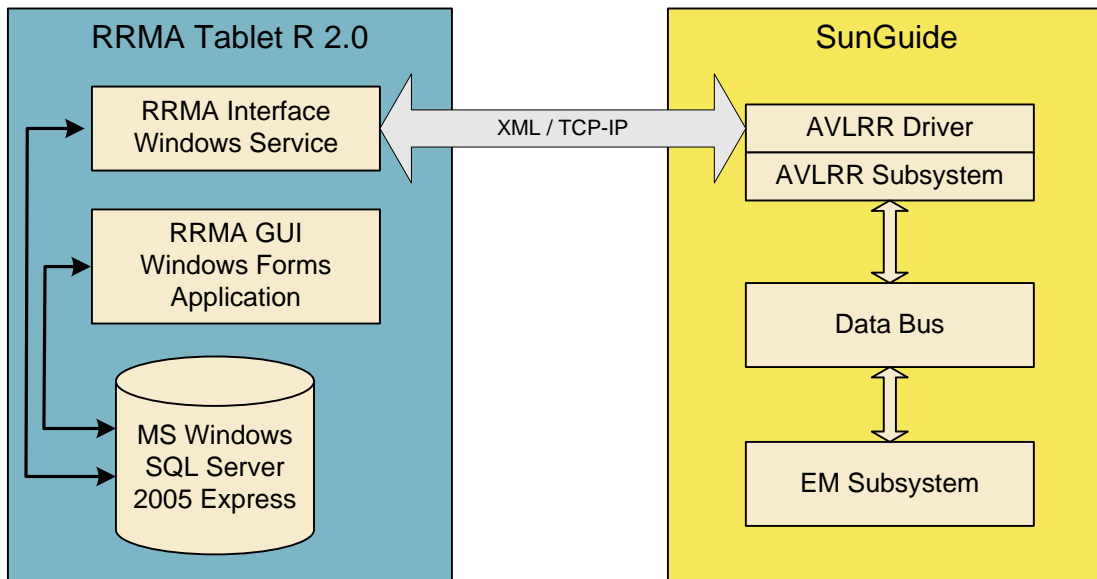
1. SCOPE

1.1 Document Identification

This Interface Control Document (ICD) describes the interface between the Road Ranger Mobile Application (RRMA) R 2.0 and relevant SunGuide driver. This ICD defines Extensible Markup Language (XML) schemas upon which relevant XML requests, responses and messages shall be based.

1.2 Project Overview

A Tablet PC running the RRMA resides in each and every FDOT D4 Road Ranger vehicle. The primary objective of the RRMA R 2.0 is to provide the Road Rangers with current event data (thereby allowing them to review and validate what has been recorded), and to capture all data when all communications (phone/ radio and network) are lost. The RRMA will also ensure data accuracy and low latency data exchange.

Revision 2.0 of District 4's Road Ranger Mobile Application (RRMA) has been redesigned to support SunGuide 3.0 – and more specifically, SunGuide AVL and EM Subsystem related requirements. Revision 2.0 of the RRMA will also incorporate a GPS Receiver, and the most recent recommendations of FDOT District 4.

The following diagram is a high level depiction of the RRMA related SunGuide software architecture.

1.3 Related Documents

The following documents have relevance to this Software Requirements Document:

(1)   IBI Scope of Services Document: *FDOT Districtwide ITS Software Support Services, Software Development Scope of Services, Revision 1.1, January 28, 2007 – Final.*

(2)   *Districtwide ITS Software Support Services, Road Ranger Mobile Application (RRMA) R.0, Revision 1.0, April xx, 2007 – Initial Release*

1.4 Contacts

The following are contact persons for the RRMA 2.0 software project:

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2. TRANSPORT MECHANISM

XML requests, responses and messages shall be exchanged between each RRMA and relevant SunGuide driver via TCP/IP. In every case, the relevant SunGuide driver will establish (initiate) and maintain the TCP connection with each RRMA. Any existing TCP connection is terminated, by the RRMA, upon reception of a new TCP connection request.

Each message shall begin with the size of the data being sent, followed by the size of the data after being decompressed, followed by the XML message itself.
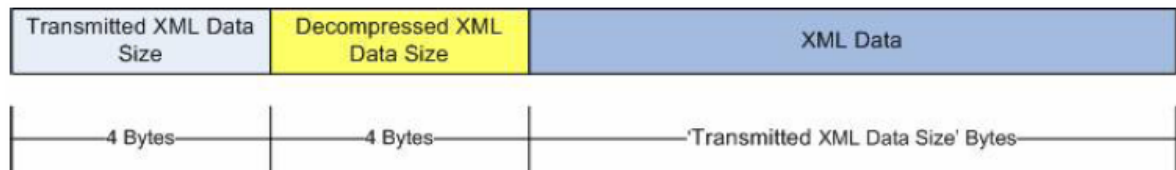
Data Item	Data Type	Size	Detailed Description
Transmitted XML Data Size	Integer	4 bytes	The size of the XML data being transmitted (if compression is being used, then this is the size of the data after compression is performed).
Decompressed XML Data Size	Integer	4 bytes	This is the size of the original message before compression. Compression will not be used by this version of the interface, so this value should be set to 0 (zero).
XML Data	String	Variable	Refer schema for specific requests, responses, and messages.

All integer and bitmap data will be in big endian byte order (i.e. the least significant byte is the farthest to the right). Bits are labeled from right (bit 0) to left of a byte or word. Strings are not null terminated and are of variable length. All XML data is ASCII encoded.

3. DATA

The following sections detail the XML transactions that can be exchanged between the RRMA and the AVLRR driver.

3.1 Schema

The objects directory contains common data schemas that are used by the various requests and responses. Schemas are organized in the following tree structure:

RRMA

- Requests

  - o replaceAgencyVehicleConfigReq.xsd
  - o replaceAllEventReq.xsd
  - o replaceEventConfigReq.xsd
  - o replaceEventReq.xsd
  - o replaceEventVehicleConfigReq.xsd
  - o replaceLocationConfigReq.xsd
  - o reportAgencyVehicleStatusReq.xsd
  - o reportAvlDataReq.xsd
  - o reportEventCommentReq.xsd
  - o reportNetworkStatusReq.xsd
  - o reportRrmaEventReq.xsd

- Responses

  - o genericResponse.xsd
  - o replaceEventResponse.xsd

3.2 RRMA Schemas

The table below lists the XML requests and responses that shall be exchanged by the RRMA and SunGuide driver. After a configurable timeout period, if a response is not received by the request sender, the request sender shall assume that the request was not received, and shall retransmit that request with a new REF_ID. The maximum number of retransmissions shall also be configurable (from 0 to infinite).

FR (From RRMA), FD (From Driver)

Usage Description	Requests	FR	FD	Responses
Used to replace RRMA agency vehicle configuration data. The SunGuide driver shall send the replaceAgencyVehicleConfigReq whenever the SunGuide agency vehicle configuration has changed. If the RRMA is unavailable during the relevant configuration change, the SunGuide driver shall send (only) the most recent replaceAgencyVehicleConfigReq when the RRMA does become available.	replaceAgencyVehicleConfigReq		X	genericResponse
Used to retrieve all currently 'open' events, for the purpose of synchronizing with SunGuide. A single replaceAllEventReq sent by the RRMA shall result in a replaceEventResponse for every currently 'open' event. The RRMA shall respond to each replaceEventResponse with the genericResponse (not otherwise depicted by this table).	replaceAllEventReq	X		replaceEventResponse
Used to replace RRMA event configuration data. The SunGuide driver shall send the replaceEventConfigReq whenever the SunGuide event configuration has changed. If the RRMA is unavailable during the relevant configuration change, the SunGuide driver shall send (only) the most recent replaceEventConfigReq when the RRMA does become available.	replaceEventConfigReq		X	genericResponse

Used to send new event to RRMA (or replace existing event in RRMA). The SunGuide driver shall send a replaceEventReq for every new and updated event. If the RRMA is unavailable during the relevant event update, the SunGuide driver shall send (only) the most recent replaceEventReq when the RRMA does become available.	replaceEventReq		X	genericResponse
Used to replace RRMA event vehicle configuration data. The SunGuide driver shall send the replaceEventVehicleConfigReq whenever the SunGuide vehicle configuration has changed. If the RRMA is unavailable during the relevant configuration change, the SunGuide driver shall send (only) the most recent replaceEventVehicleConfigReq when the RRMA does become available.	replaceEventVehicleConfigReq		X	genericResponse
Used to replace RRMA location configuration data. The SunGuide driver shall send the replaceLocationConfigReq whenever the SunGuide location configuration has changed. If the RRMA is unavailable during the relevant configuration change, the SunGuide driver shall send (only) the most recent replaceLocationConfigReq when the RRMA does become available.	replaceLocationConfigReq		X	genericResponse
Used to report agency vehicle status to SunGuide.	reportAgencyVehicleStatusReq	X		genericResponse
Used to report AVL data to SunGuide. The RRMA shall send the reportAvlDataReq at a configurable interval.	reportAvlDataReq	X		genericResponse
Used to report event comment data for SunGuide generated events.	reportEventCommentReq	X		genericResponse
Used to report RRMA network status to SunGuide.	reportNetworkStatusReq	X		genericResponse
Used to report event data to SunGuide.	reportRrmaEventReq	X		genericResponse

ATTACHMENT 1

RRMA XML Schem