



**SpryPoint**  
SMART SOLUTIONS FOR SMART UTILITIES

# SpryIDM - Sensus Integration design document

**CITY OF  
CARTERSVILLE**

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# Table of Contents

<b>Table of Contents</b>	<b>1</b>
Author(s)	2
Document History	2
Statement of Confidentiality	2
Definitions	3
<b>Integration Details</b>	<b>4</b>
Purpose	4
Background and Business Value	5
Business Requirements	6
Integration approach	6
Meter information	7
Electric readings	7
Water readings	7
Gas readings	7
Interval readings frequency	7
Scalability	8
Data accessibility	8
Historical information	8
Dependencies	10
Assumptions	10
Gap Analysis	11
Outstanding Decisions & Questions	13
<b>Document Approval</b>	<b>14</b>

## Author(s)

Name	Role
<b>Jorge Basante</b>	Product Owner

## Document History

Date	Version
<b>Dec 05, 2023</b>	1.0 - Initial content

## Statement of Confidentiality

The contents of this report are confidential and are supplied on the understanding that they will be held confidentially and not disclosed to third parties without the prior written consent of SpryPoint.

## Definitions

- AMI: Advanced metering infrastructure.
- CSV (Comma-separated values): a text file format that uses commas to separate values.
- Sensus: AMI provider.
- SFTP (secure file transfer protocol): a network protocol for securely accessing, transferring and managing large files and sensitive data.
- SpryEngage: customer self-service portal.
- SpryIDM: the central application for collecting, storing, and retrieving interval data from Smart Meters. It is a gateway, allowing all SpryPoint products to query and present interval data from meters.

# Integration Details

## Purpose

This document outlines the functional requirements and objectives for the integration between SpryIDM and Sensus. The primary objective of this integration is to empower the City of Cartersville with a robust and efficient means of transferring interval meter readings through the integration with Sensus. This collaborative effort aims to provide utility customers with a more transparent and informative experience.

The integration with Sensus brings forth a multitude of benefits for both the City of Cartersville and its customers. The pivotal value lies in the provision of interval meter readings through our Customer Self-Service Portal - SpryEngage. This will enable customers to access and analyze their consumption patterns in near real-time, fostering a deeper understanding of their usage so they can make informed decisions, promote efficiency, and cost-effectiveness.

In the following sections of this document, we will delve into the technical aspects of the integration, detailing the necessary steps, configurations, and considerations to ensure a seamless implementation.

## **Background and Business Value**

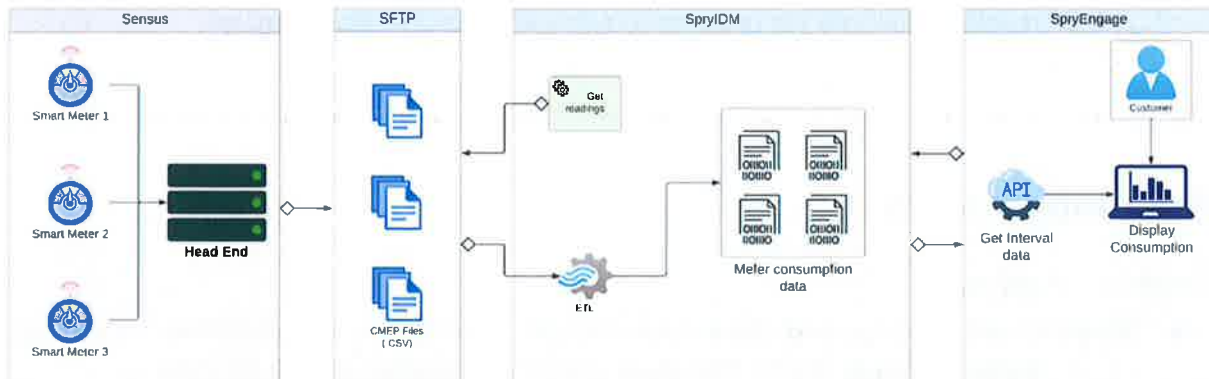
The City of Cartersville aims to enhance customer experience by enabling its customers to access interval data information (daily and hourly). This collaboration not only elevates operational efficiency but also aligns with the industry's growing demand for customer-centric services. Empowering customers with detailed, timely information enhances their overall experience and strengthens the utility-customer relationship.

# Business Requirements

## Integration approach

The integration between SpryIDM and Sensus leverages a file-based approach using the RNI Extended California Metering Exchange Protocol (CMEP) - ARM-10006-25. This integration aims to facilitate the seamless exchange of interval meter reading data in CSV format, encompassing water, gas, and electricity meters.

### Integration Workflow



- **Data Generation by Sensus:**
  - Sensus will generate a CSV file every 4 hours containing interval meter readings for all meters (water, gas, and electricity).
  - The CSV file adheres to the RNI Extended CMEP (ARM-10006-25) format, ensuring compatibility with industry standards.
- **File Placement on SFTP:**
  - Sensus will place the generated CSV file onto the SFTP (Secure File Transfer Protocol) server provided by our MDM solution, SpryIDM.
  - SpryPoint will provide the SFTP account information.
- **Automated Processing by SpryIDM:**
  - SpryIDM will provide a configurable automated process that continuously monitors the SFTP directory.
  - Upon identifying a new CSV file, SpryIDM will extract, validate, and load the meter reading information into its database.
- **Data Extraction and Validation:**
  - SpryIDM will process the following MEPMD01: Metering Data Type 1 extended record format.
  - The automated process within SpryIDM will extract the relevant information from the CSV file, including:
    - Meter ID
    - Reading date and time
    - Commodity
    - Dial and Consumption Reads

- Unit of measurement
- Data quality flag
- SpryIDM will perform data validation checks to ensure the integrity and consistency of the information according to the extended format record.
- If there is any inconsistency, Sensus must provide a new file to be processed.
- Loading into SpryIDM:
  - SpryIDM will store the interval readings in its database, associating each interval meter reading with the corresponding meter.
- Availability for SpryEngage:
  - Post successful loading, the interval meter reading information becomes readily available for query and retrieval through SpryEngage.

## Meter information

### Electric readings

- SpryIDM will process and store data related to electricity consumption, including:
  - Kilowatt-hours (kWh): The total energy consumed in the interval.
  - Kilowatts (kW): The instantaneous power demand during the interval.
  - Kilovolt-Ampere Reactive (kVAR): The reactive power in the system during the interval.
  - For customers involved in net metering, additional metrics include:
    - Kilowatt-hours received (kWh): The energy consumed by the customer during the interval.
    - Kilowatt-hours delivered (kWh): The surplus energy injected into the grid during the interval.

### Water readings

- SpryIDM will process and store water consumption data, including:
  - Gallons (Gal/kGal): The total volume of water consumed during the interval.

### Gas readings

- SpryIDM will process and store gas consumption data, including:
  - Thousands/Hundreds of Cubic Feet (MCF/CCF): The total volume of gas consumed during the interval.

### Interval readings frequency

For all service types (electric, water, and gas), interval readings will be received and recorded at hourly intervals.



## Scalability

The integration design will account for scalability, ensuring that SpryIDM can seamlessly handle the current volume of meter readings and the expected growth rate.

- **Electric:** The integration will cater to 9,000 electricity meters, with an anticipated annual growth rate of 10%.
- **Water:** The integration will accommodate 12,000 water meters, expecting an annual growth rate of 10%.
- **Gas:** Similar to water, the integration will cover 12,000 gas meters, with a projected annual growth rate of 10%.

## Data accessibility

Newly acquired interval data readings will become visible to end-users (customers and CSRs) within SpryEngage based on the schedule set by Sensus for delivering interval readings to SpryIDM and the processing time required by SpryIDM.

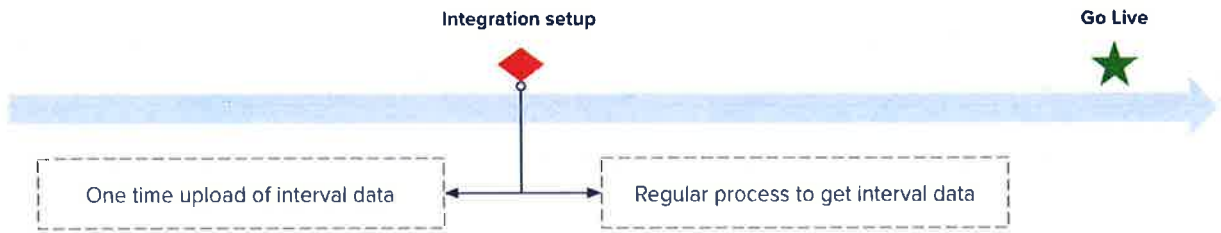
Step-by-Step Process:

- Every 4 hours, Sensus generates a CSV file containing interval meter readings for all meters (electric, water, and gas).
- Sensus places the generated CSV file onto the SFTP server provided by SpryIDM.
- SpryIDM initiates an automated process to extract, validate, and load the interval meter reading data into the database.
- The interval meter reading information becomes available for query and retrieval through the SpryEngage self-service portal.

## Historical information

As we set up the integration between SpryIDM and Sensus to begin receiving interval meter readings promptly, there's a crucial consideration for historical data which is crucial for customers to track and understand their past consumption patterns. Also, it serves as a foundation for processes like usage forecasting, enhancing the accuracy of predictive models.

- Sensus must provide a CSV file in the CMEP format with all meter interval readings before the initiation of this integration.
- SpryIDM will provide a process to store historical meter readings.



## Dependencies

### Sensus

The successful implementation of this integration is contingent upon Sensus providing CSV files in the expected format. The seamless flow of interval meter readings into SpryIDM relies on the timely and consistent delivery of files adhering to the RNI Extended CMEP (ARM-10006-25) protocol. Any deviations from the specified format will require modifications.

### File format

If the format utilized by Sensus/City of Cartersville differs from the specifications detailed in this document, it is expected that Sensus will provide the alternate format for thorough comparison and discrepancy identification.

## Assumptions

### Daily provision of files

It is assumed that Sensus will consistently provide daily CSV files containing measurements for all meters across all services at intervals of every 4 hours. The integration process is designed with the expectation of a regular and timely data supply from Sensus to ensure ongoing accuracy and completeness of interval meter readings.

### Recovery for missing data

In the event of any day when files or information for meters are missing, it is assumed that Sensus will subsequently provide the missing files or information for processing. This assumption accounts for potential occasional disruptions or delays in data delivery, ensuring that the integration process can recover and maintain continuity in the data flow.

# Gap Analysis

This section highlights what SpryIDM currently lacks to meet new project requirements. It identifies specific missing features and outlines the needed actions for meeting the requirements.

## 1. Active power (kW)

The "Active power" needs to be properly transmitted to SpryEngage so it can be displayed in the consumption graphs.

### Gap

SpryIDM can process and store active power (kW). However, the current interval readings query only provides the difference between readings rather than the absolute values.

### Action Required

Development efforts are required to adjust the SpryIDM interval readings query. In the case of instantaneous consumption types such as kW or KVAR, the query should return the highest reading within the time frame (e.g. daily) rather than the difference between readings.

## 2. Reactive power (kVAR)

The "Reactive power" needs to be properly transmitted to SpryEngage so it can be displayed in the consumption graphs.

### Gap

SpryIDM can process and store reactive power (kVAR). However, the current interval readings query only provides the difference between readings rather than the absolute values.

### Action Required

Development efforts are required to adjust the SpryIDM interval readings query. In the case of instantaneous consumption types such as kW or KVAR, the query

should return the highest reading within the time frame (e.g. daily) rather than the difference between readings.

# Outstanding Decisions & Questions

#	Question
1	

# Document Approval

The City of Cartersville has had the opportunity to review this report and at this time finds no issue with the content.

City of Cartersville Approved by:

\_\_\_\_\_  
Signature of Authorized Representative of  
the City of Cartersville

Name (print):

\_\_\_\_\_

Date: \_\_\_\_\_

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SpryPoint Accepted by:

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Name (print):

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Date: \_\_\_\_\_

