



# S7-1200: Basic Controller with Advanced Functions

Data Logging & Recipes

# Data Logging

# Data Logging & Recipes

## Data Logging – Instruction set

| Extended instructions     |                      |  |
|---------------------------|----------------------|--|
| Name                      | Version              |  |
| ▶ Date and time-of-day    | V2.2                 |  |
| ▶ String + Char           | V3.7                 |  |
| ▶ Distributed I/O         | V2.7                 |  |
| ▶ PROFlenergy             | V2.7                 |  |
| ▶ Interrupts              | V1.2                 |  |
| ▶ Alarming                | V1.5                 |  |
| ▶ Diagnostics             | V1.7                 |  |
| ▶ Pulse                   | V1.1                 |  |
| ▼ Recipe and data logging | V1.3                 |  |
| Recipe functions          |                      |  |
| ■ RecipeExport            | V1.2                 |  |
| ■ RecipeImport            | V1.2                 |  |
| Data Logging              |                      |  |
| ■ DataLogCreate           | V1.0                 |  |
| ■ DataLogOpen             | <a href="#">V1.1</a> |  |
| ■ DataLogWrite            | V1.0                 |  |
| ■ DataLogClear            | V1.1                 |  |
| ■ DataLogClose            | V1.0                 |  |
| ■ DataLogDelete           | V1.1                 |  |
| ■ DataLogNewFile          | <a href="#">V1.1</a> |  |
| ▶ Data block control      | V1.3                 |  |

Data logging is a feature that is commonly used to log process values over a set period of time. This is a standard function natively available in the S7-1200 through the use of pre-configured function blocks.

Data logs can be saved on an optional SIMATIC Memory Card (SMC) or in the internal load memory. The data logs are saved in CSV format (Comma Separated Value).

The instruction set can be seen via the "Instructions" task card upon opening the LAD editor in the TIA Portal.

- **DataLogCreate** - create a data log
- **DataLogOpen** – opens a created data log
- **DataLogWrite** – writes to the opened data log
- **DataLogClear** – deletes all data records in an opened data log
- **DataLogClose** – closes the opened data log
- **DataLogDelete** – deletes a specified data log file from memory
- **DataLogNewFile** - creates a new data log with the same properties as an already existing data log.

Recipes contain data that belongs together such as data for a specific batch of products in production.

Recipe functionality is natively available in all SIMATIC HMIs, however you can also use this without an HMI via the integrated web server of the S7-1200 controller.

The instruction set can be seen via the "Instructions" task card upon opening the LAD editor in the TIA Portal.

- **RecipeExport** – transfers contents of the recipe data block into a recipe file in CSV format
- **RecipeImport** – transfers the contents of a recipe file in CSV format into the recipe data block



# Data Logging & Recipes

## Data Logging – Export Logs

**S7-1200: Compact Controller with Advanced Capabilities**

State: Idle | Lot Number: 10012 | Operator: [ ]

Conveyor: [Disable] [Homed] [Start] [Production] [Cur] [tion] [Heating S]

Buttons: Demo, PID, Motion, Wiper, Security, Recipe

**Data Logs**

| Name                                | Size | Changed              | Active |
|-------------------------------------|------|----------------------|--------|
| <a href="#">Production_Data.csv</a> | 1147 | 10:15:34 pm 6/4/2020 | Yes    |

Opening Production\_Data.csv

You have chosen to open:

**Production\_Data.csv**  
which is: Microsoft Office Excel Comma Separated Values File (1.1 KB)  
from: http://192.168.0.10

What should Firefox do with this file?

☒ Open with: Microsoft Office Excel (default)

☐ Save File

OK Cancel

1. On the HMI, navigate to "Demo" screen
2. Enable the conveyor by pressing "Enable"
3. "Reset" to home the conveyor axis
4. Press "Start" to begin production
5. Repeat step 4 two more times



Notice the Lot number increasing each production cycle. This is one of the data points being logged in the data log

6. On your PG/PC, open a web browser and type in the IP address of the CPU in the address bar (192.168.0.10)
7. Navigate to "Data Logs"
8. Click on the data log "Production\_Data.csv" to open/save the log file.

If prompted, open the log file with Microsoft Excel

Notice the logged production data.



# Recipes

# Data Logging & Recipes

## Recipes – Exporting Recipes to CSV file



**S7-1200: Compact Controller with Advanced Capabilities**

State **Idle** ... Lot Number **10000** Operator ... ✓

Beer Recipe 1 Beer Recipe 2

|              |                |           |                 |
|--------------|----------------|-----------|-----------------|
| Product Name | Ingenuity Pils |           |                 |
| Water        | Barley         | Wheat     | Hops            |
| 10           | 9              | 3         | 280             |
| Yeast        | Water Temp     | Mash Temp | Mash Time (min) |
| 39           | 40             | 30        | 100             |

2 Save Recipe Load Recipe

1 Demo PID Motion Wiper Security Recipes Web Server

1. On the HMI, navigate to the "Recipe" screen
2. Click the "Save Recipe" button to export the recipes to the internal load memory of the CPU.

The 'RecipeExport' instruction is a standard function block that can handle exporting recipes from a data block into a CSV file which is accessible from the integrated web server.

From there the user can download and modify the recipe values from their PC and then download to the modified CSV back into the PLC using the integrated web server.



# Data Logging & Recipes

## Recipes – Recipes from the Web Server

**1** Browser icon

**2** File Browser link

**3** Recipe\_Data.csv file

**4** Download icon

**5** Delete icon

**6** Browse button

**7** Upload file button

| Index | ProductName | water | barley | wheat | hops | yeast | waterTmp | mashTmp | mashTime | QTest |
|-------|-------------|-------|--------|-------|------|-------|----------|---------|----------|-------|
| 1     | Pils        | 9     | 8      | 2     | 180  | 29    | 30       | 20      | 90       | 0     |
| 2     | Lager       | 9     | 8      | 2     | 50   | 23    | 40       | 20      | 110      | 0     |
| 3     | IPA         | 9     | 8      | 2     | 310  | 37    | 50       | 20      | 80       | 1     |

| Index | ProductName    | water | barley | wheat | hops | yeast | waterTmp | mashTmp | mashTime | QTest |
|-------|----------------|-------|--------|-------|------|-------|----------|---------|----------|-------|
| 1     | Ingeniuty Pils | 10    | 9      | 3     | 280  | 39    | 40       | 30      | 100      | 0     |
| 2     | Werner Lager   | 10    | 9      | 3     | 150  | 33    | 50       | 30      | 120      | 0     |
| 3     | Siemens IPA    | 10    | 9      | 3     | 410  | 47    | 60       | 30      | 90       | 1     |

- On your PG/PC, open a web browser and type the IP address of the CPU in the address bar (192.168.0.10)
- Navigate to 'File Browser'
- Click Recipes and download 'Recipe\_Data.csv'  
If prompted, open the file using Microsoft Excel
- Open another recipe CSV file "Recipe\_Data" from the following folder directory:  
*Desktop\S7-1200 Event\Recipe\_Data.csv*  
 Split windows in Excel and notice the different product names and values between the two recipes.
- On the web page, delete the existing recipe CSV file by clicking on the recycle bin in the "Delete" column
- Click 'Browse' and select the new recipe file from step 4.
- Click 'Upload'



# Data Logging & Recipes

## Recipes – Importing from a CSV file

**S7-1200: Compact Controller with Advanced Capabilities**

State **Idle** ... Lot Number **10000** Operator ...

Beer Recipe 1 Beer Recipe 2

Product Name **Pils**

|           |            |           |                 |
|-----------|------------|-----------|-----------------|
| Water     | Barley     | Wheat     | Hops            |
| <b>9</b>  | <b>8</b>   | <b>2</b>  | <b>180</b>      |
| Yeast     | Water Temp | Mash Temp | Mash Time (min) |
| <b>29</b> | <b>30</b>  | <b>20</b> | <b>90</b>       |

**Save Recipe** **Load Recipe**

Demo PID Motion Wiper Security **Recipes** Web Server

1. On the HMI, navigate to the "Recipe" screen
2. Click the "Load Recipe" button to update the recipes with the modified recipe.



Notice the new recipe values are adapted.

The 'RecipeImport' instruction is a standard function block that can handle importing recipes from a CSV file into a data block.

From there the user can access the new recipe values or parameters via the use program.



# End of 'Data Logging & Recipes'



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