**Waste Pump Activation During Print Job**

**For Objet500 (Waste Pump Timeout)**

**Software Design Review**

****

**Written by: Doron Or**

**May 2014  
 DR Version: 2.0**

Table of Contents

[1. Introduction 3](#_Toc395537410)

[1.1. Background 3](#_Toc395537411)

[1.2. Design Goals 3](#_Toc395537412)

[1.3. Abbreviations and Acronyms 3](#_Toc395537413)

[2. Architecture and Implementation 4](#_Toc395537414)

[2.1. Turn On\Off Waste Pump Diagram 4](#_Toc395537415)

[2.5. Embedded Application 5](#_Toc395537416)

[2.6. Parameters 5](#_Toc395537417)

[2.7. Logs 5](#_Toc395537418)

[3. Development 6](#_Toc395537419)

[3.1 Limitations & risks 6](#_Toc395537420)

[3.2 Development Stages 6](#_Toc395537421)

[4. Operation 6](#_Toc395537422)

[4.1 Limitations 6](#_Toc395537423)

[4.2 Installation 6](#_Toc395537424)

[5. Testing 7](#_Toc395537425)

[6. Effort Estimation 7](#_Toc395537426)

# Introduction

## Background

The Waste Pump is one of the most frequently replaced components of the machine.

According to CS it’s due to the fact it is running non-stop while printing.

To lengthen its expected product-life It was decided to activate the waste pump only when needed while printing:

During Purge and five minutes after purge is done.

This is accomplished by changed in EM SW.

## Design Goals

1. To change the behavior of waste pump only where needed, printing sequence, without interfering with other flows.
2. To use as much existing logic as possible to ensure correct behavior.

## 1.3. Abbreviations and Acronyms

|  |  |
| --- | --- |
| **Abbreviation** | **Description** |
| SW | Software. |
| DR | Design Review. |
| EM | Embedded application. |
| HW | Hardware. |

# Architecture and Implementation

## 2.1. Turn On\Off Waste Pump Diagram



## 2.5. Embedded Application

**1.** **Add “void CBackEndInterface::SetDirtPump(bool WasteOnOff, bool RollerOnOff); method.**  
 The function set the state of waste and roller pump  
 - Turns on\off Waste Pump  
 - Turns on\off Roller Pump

- Turns on\off appropriate maintenance counters.  
 - Writes to log file

**2.** **Calling to “SetDirtPump (bool, bool)” in the following methods:**  
 - TCartridgeErrorForm::WasteStatusTimerTimer(TObject \*Sender)

1. **Adding new method** “CActuatorBase::SetWastePumpOnOff(bool OnOff) “   
   - Turns On\Off Waste pump   
   - Turns on\off Waste pump maintenance counter.  
   - Writes to log file
2. **Adding new method** “CActuatorBase::SetWasteRollerOnOff(bool OnOff) “   
   - Turns On\Off Roller pump   
   - Turns on\off Roller pump maintenance counter.  
   - Writes to log file

## 2.6. Parameters

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Default Value** | **Unit** | **Type** | **Hidden** | **File** | **Description** | **Comment** |
| WastePumpOnTimeLimitForPrintInSec | 300 | seconds | int | False | Q2rt.cfg  Q2rt.ref | Waste Pump timeout after purge during print job in seconds. |  |

## 2.7. Logs

1) When Activating\Deactivating Waste pump the following message written to log: “Waste Pump On”\“Waste Pump Off”

2) When Activating\Deactivating Roller pump the following message written to log: “Roller Pump On”\ “Roller Pump Off

# 3. Development

## 3.1 Limitations & risks

1. Possibility of “flooding”

2. Need to check scenario where printing is paused due to liquid shortage\Cartridge error

3. Need to check that other aspects of the EM logic haven’t been harmed (wizard flows for instance)

3. Maybe more scenarios we missed

## Development Stages

1. First the development will be done in Objet500 58.11 version and released as an experimental executable for testing
2. After testing thoroughly we’ll implement SW changes and updates

# 4. Operation

## Limitations

## Installation

# 5. Testing

See that during printing flow works as described.  
Test other flows that change operation of waste pump such as: Pause\Resume print, Cartridge error pause, wizard flows.  
See if 5 minutes timeout is enough.

# 6. Effort Estimation

Effort estimation is **4d**  working days for **Objet500**, including implementation and testing.