

Requirements Embeddes Systems Project

| ID | Name | Description | Version | Status |
|----|-----------------------------|---|---------|--------|
| 1 | Service movement | In service mode, the conveyer belt shall be able to move to both directions with the specified velocity profile. | 1 | Done |
| 2 | Service speed | In service mode, speed of conveyer belt shall be modifiable by the user within 100 – 2200 rpm in steps of 100. | 1 | Done |
| 3 | Chain movement | In chain mode, the conveyer belt shall move only be able to move into the right direction, towards the next conveyer. | 1 | Done |
| 4 | Request left | If the controller is in idle state, the conveyer belt shall wait for request from left conveyer belt. | 1 | Done |
| 5 | Send wait | If conveyer belt is moving state and server running on the controller gets a request, the server shall send “Wait” to left conveyer belt. | 1 | Done |
| 6 | Send read | If the conveyer belt is in idle state and server receives a request, the server shall send “Ready” Signal to left conveyer belt | 2 | Done |
| 7 | Slow movement | If server sent “Ready”, conveyer belt shall start moving with $v = 100\text{rpm}$ for $t_{pp}=1$ second and get in moving state | 2 | Done |
| 8 | Send release | After conveyer belt is moving tpp with $v = 100\text{rpm}$, server shall send “Release” to left conveyer belt | 2 | Done |
| 9 | Profile movement | If server send “Release”, conveyer belt start moving with specified profile | 2 | Done |
| 10 | Send request | After conveyer belt is moving specified profile, client shall sent request to right conveyer belt | 1 | Done |
| 11 | Get wait | If client get “Wait”, conveyer belt shall be stop | 2 | Done |
| 12 | Get ready | If client get “Ready”, conveyer belt shall start moving with $v = 100\text{rpm}$ | 2 | Done |
| 13 | Get release | If client get “Release”, conveyer belt shall be stop and get in idle state | 2 | Done |
| 14 | Controller Communication I | The Server implemented on the slave, must be able to understand the commands Wait, Ready and Release. | 1 | Done |
| 15 | Controller Communication II | The Client shall be able to send readable commands to the server of the next conveyor belt in line. | 1 | Done |
| 16 | Motor control | The speed of motor during the constant drive time t_t shall be controlled by closed loop PID. | 1 | Test |

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| 17 | PID Controller | The PID controller is already provided by the user of the system. | 1 | Done |
| 18 | Operate mode | The conveyer belt shall be operated by local keyboard or telnet connection from a local PC in the Embedded Systems Laboratory U131. | 1 | Done |
| 19 | Information Chain Mode | The parameters for the max velocity, the current mode of operation, direction, rise and fall time, state, shall be displayed on display board. | 1 | Done |
| 20 | Information Service Mode | The parameters for the max velocity, the current mode of operation, direction, rise and fall time, state and cursor shall be displayed on display board. | 1 | Done |
| 21 | Keyboard Button Actions Stop mode | If "0" pressed mode shall change to service mode, If "1" pressed mode shall change to chain mode; | 1 | Done |
| 22 | Telnet Button Actions Stop mode | If "0" pressed mode shall change to service mode, If "1" pressed mode shall change to chain mode; | 1 | Done |
| 23 | Keyboard Button Actions service mode | If "A" pressed conveyer belt start, With number buttons tr,tf,tt shall be modifiable, If "F" pressed mode shall change to stop mode With number buttons v shall be modifiable, | 1 | Done |
| 24 | Telnet Button Actions service mode | If "A" pressed conveyer belt start, With number buttons tr,tf,tt shall be modifiable, If "F" pressed mode shall change to stop mode With number buttons v shall be modifiable, | 1 | Done |
| 25 | Keyboard Button Actions chain mode | If "F" pressed mode shall change to stop mode | 1 | Done |
| 26 | Telnet Button Actions chain mode | If "F" pressed mode shall change to stop mode | 1 | Done |
| 27 | Hardware | The system shall be implemented on the lab boards in the Embedded Systems Lab in U131. | 1 | Done |
| 28 | Used Technology | The conveyer belt shall be programmed with the programming languages C/C++. | 1 | Done |
| 29 | Changes | If a requirement changes, the explicit border wall | 1 | Done |

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| 30 | Profile parameter v | In chain mode, velocity-parameter v shall be 1800rpm | 1 | Done |
| 31 | Profile parameter tr/tf | In chain mode, acceleration-time tr and tf shall be 1 second long. | 1 | Done |
| 32 | Profile parameter tt | In chain mode, the parameter tt shall be 8 seconds. | 1 | Done |
| 33 | Change mode | The Mode of Operation shall only be changeable in stop state and error state. | 1 | Done |
| 34 | Extra Task Stop | If the conveyor is in service mode, the running profile can be interrupted at any time. | 1 | Done |
| 35 | Extra Task Time | If the conveyor is in service mode, the time parameters tt, tr and tf of the profile are modifiable via a local telnet connection and directly from the keyboard. | 1 | To Do |
| 36 | Extra Task FTA | A complete top down Fault Tree Analysis shall be performed for the system. | 1 | Done |