

## 0.1 Matlab: minseg.m

### List of Contents

0.1	Matlab: minseg.m . . . . .	1
0.1.1	Global . . . . .	4
0.1.2	User Inputs . . . . .	5
0.1.3	Initialization . . . . .	6
0.1.3.1	General . . . . .	6
0.1.3.2	Model . . . . .	6
0.1.3.2.1	General . . . . .	6
0.1.3.2.2	Plant . . . . .	7
0.1.3.2.2.1	Hardware . . . . .	7
0.1.3.2.2.2	Nonlinear model . . . . .	7
0.1.3.2.2.3	Linear model . . . . .	7
0.1.3.2.3	Controller . . . . .	8
0.1.3.2.4	Board Inputs and Outputs . . . . .	8
0.1.3.2.5	Build Parameters . . . . .	8
0.1.3.3	Serial . . . . .	9
0.1.3.3.1	Write . . . . .	9
0.1.3.3.2	Read . . . . .	9
0.1.3.3.3	General . . . . .	9
0.1.3.3.4	Reads . . . . .	9
0.1.3.3.5	Build Parameters . . . . .	9
0.1.4	Processing . . . . .	10
0.1.4.1	Build . . . . .	10
0.1.4.2	Serial Transmission . . . . .	10
0.1.4.3	Serial Reads Post-Processing . . . . .	10
0.1.5	Output . . . . .	11
0.1.5.1	Save . . . . .	11

0.1.5.2	Plot . . . . .	11
0.1.6	Global Cleanup . . . . .	12

The *minseg.m* script was developed to control the MinSeg test platform. The script is capable of:

- Reconfiguring the model
- Running a model simulation
- Programming the model hardware
- Communicating with the model hardware
  - Optimizing the communication rate.
  - Reformatting the raw hardware-output data on receipt.
- Saving the initialization parameters and output data.
- Plotting the output data.

The script is hierarchal, and is therefore only the root *or master* file to a series of subfiles. The subfiles are broken up into principal segments of the scripting process:

- Global setup
- User-input
- Initialization
- Processing
- Output
- Global Cleanup

### 0.1.1 Global

### 0.1.2 User Inputs

### **0.1.3 Initialization**

#### **0.1.3.1 General**

#### **0.1.3.2 Model**

##### **0.1.3.2.1 General**

#### **0.1.3.2.2 Plant**

##### **0.1.3.2.2.1 Hardware**

##### **0.1.3.2.2.2 Nonlinear model**

##### **0.1.3.2.2.3 Linear model**

#### **0.1.3.2.3 Controller**

#### **0.1.3.2.4 Board Inputs and Outputs**

#### **0.1.3.2.5 Build Parameters**



### **0.1.3.3 Serial**

#### **0.1.3.3.1 Write**

#### **0.1.3.3.2 Read**

#### **0.1.3.3.3 General**

#### **0.1.3.3.4 Reads**

#### **0.1.3.3.5 Build Parameters**

## **0.1.4 Processing**

### **0.1.4.1 Build**

### **0.1.4.2 Serial Transmission**

### **0.1.4.3 Serial Reads Post-Processing**

### **0.1.5 Output**

#### **0.1.5.1 Save**

#### **0.1.5.2 Plot**

### **0.1.6 Global Cleanup**