

“SmartControl” LLM Input Examples

Description:

For each example:

1. User Input: Natural-language performance requirement.
 2. LLM Prompt: Full prompt used by extract_target_* functions.
 3. Expected Output: The three extracted numbers: settling time (s), overshoot (%), rise time (s).
 4. Parsing Steps: How the LLM should identify and output each value.
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Example 1

User Input:

“The system must settle within 1.5 seconds, overshoot no more than 2 %, and have a rise time under 0.4 s.”

Expected Outputs:

- Settling time: 1.5
- Overshoot: 2.0
- Rise time: 0.4

Parsing Steps:

1. Locate “settle within 1.5 seconds” → extract 1.5.
 2. Locate “overshoot no more than 2 %” → extract 2.
 3. Locate “rise time under 0.4 s” → extract 0.4.
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Example 2

User Input:

“I need a settling time shorter than 3 s and keep overshoot below 5 %, with at least 0.8 s rise time.”

Expected Outputs:

- Settling time: 3.0
- Overshoot: 5.0
- Rise time: 0.8

Parsing Steps:

1. “shorter than 3 s” ⇒ 3.0.

2. “overshoot below 5 %” \Rightarrow 5.0.
 3. “at least 0.8 s rise time” \Rightarrow 0.8.
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Example 3

User Input:

“Aim for overshoot under 1%, settling in about 2 seconds, and a minimum rise time of 0.2 s.”

Expected Outputs:

- Settling time: 2.0
- Overshoot: 1.0
- Rise time: 0.2

Parsing Steps:

1. “settling in about 2 seconds” \Rightarrow 2.0.
 2. “overshoot under 1%” \Rightarrow 1.0.
 3. “minimum rise time of 0.2 s” \Rightarrow 0.2.
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Example 4

User Input:

“Max overshoot should be 10 %, and settle no slower than 4 s; rise time want faster than 1 s.”

Expected Outputs:

- Settling time: 4.0
- Overshoot: 10.0
- Rise time: 1.0

Parsing Steps:

1. “settle no slower than 4 s” \Rightarrow 4.0.
 2. “Max overshoot should be 10 %” \Rightarrow 10.0.
 3. “rise time want faster than 1 s” \Rightarrow 1.0.
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Example 5

User Input:

“Set the rise time to 0.6 s or quicker, overshoot \leq 3 %, and target settling time = 2.5 s.”

Expected Outputs:

- Settling time: 2.5
- Overshoot: 3.0
- Rise time: 0.6

Parsing Steps:

1. “target settling time = 2.5 s” \Rightarrow 2.5.
 2. “overshoot \leq 3 %” \Rightarrow 3.0.
 3. “rise time to 0.6 s or quicker” \Rightarrow 0.6.
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Example 6**User Input:**

“I’d like a 5 s settling time, maximum 0 % overshoot, and at least 0.2 s rise time.”

Expected Outputs:

- Settling time: 5.0
- Overshoot: 0.0
- Rise time: 0.2

Parsing Steps:

1. “5 s settling time” \Rightarrow 5.0.
 2. “maximum 0 % overshoot” \Rightarrow 0.0.
 3. “at least 0.2 s rise time” \Rightarrow 0.2.
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Example 7**User Input:**

“Ensure rise time does not exceed 0.7 s, overshoot kept at 4 %, settling time \approx 3.5 sec.”

Expected Outputs:

- Settling time: 3.5
- Overshoot: 4.0
- Rise time: 0.7

Parsing Steps:

1. “settling time \approx 3.5 sec” \Rightarrow 3.5.
2. “overshoot kept at 4 %” \Rightarrow 4.0.
3. “rise time does not exceed 0.7 s” \Rightarrow 0.7.

Example 8

User Input:

“Fast system: rise time under 0.3 s, settle by 1 s, overshoot no more than 6%.”

Expected Outputs:

- Settling time: 1.0
- Overshoot: 6.0
- Rise time: 0.3

Parsing Steps:

1. “settle by 1 s” \Rightarrow 1.0.
 2. “overshoot no more than 6%” \Rightarrow 6.0.
 3. “rise time under 0.3 s” \Rightarrow 0.3.
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Example 9

User Input:

“I want a very smooth response: less than 1 % overshoot, rise time > 0.9 s, settling around 4.2 s.”

Expected Outputs:

- Settling time: 4.2
- Overshoot: 1.0
- Rise time: 0.9

Parsing Steps:

1. “settling around 4.2 s” \Rightarrow 4.2.
 2. “less than 1 % overshoot” \Rightarrow 1.0.
 3. “rise time > 0.9 s” \Rightarrow 0.9.
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Example 10

User Input:

“Maximum overshoot 8 %, settling time no more than 3 s, and minimum rise time requirement is 0.5 s.”

Expected Outputs:

- Settling time: 3.0

- Overshoot: 8.0
- Rise time: 0.5

Parsing Steps:

1. “settling time no more than 3 s” \Rightarrow 3.0.
2. “Maximum overshoot 8 %” \Rightarrow 8.0.
3. “minimum rise time requirement is 0.5 s” \Rightarrow 0.5.