1. A Doppler-radar based intrusion detection system (“a burglar alarm”) is measuring a single sinusoidal voltage that varies between –15 and +15 V. And the frequency is between 5 and 100 Hz. The measured waveform is displayed on a screen for supervision purposes.

Match the External Interface Requirements (EIR) for this particular input (see Section 5.1.2 of the textbook) with a coherent description. The answers might contain additional specifications to illustrate the necessary data for your requirements.

**EIR**

1. **Name of the item**

1. **Description of purpose**
2. **Source of input**
3. **Valid range**
4. **Accuracy**
5. **Units of measure**
6. **Timing**
7. **Relationships to other inputs**
8. **Relationship to outputs**
9. **Data format**

**Description**

|  |  |
| --- | --- |
|  | The A/D-converted samples are 16-bit unsigned integers; –15.1 V = 0000 (hex), 0 V = 7FFF (hex), +15.1 V = FFFF (hex); 1 bit corresponds to 0.46 mV |
|  | Measures Doppler waveforms for supervision purposes |
|  | The measurement accuracy must be better than +/– 10 mV |
|  | The maximum voltage from the intrusion detector is +15 V and the minimum –15 V; to avoid saturation, the voltage range shall be –15.1 V … +15.1 V |
|  | The buffered Doppler output of a radar-based intrusion detector |
|  | None |
|  | The sampling period is 0.25 ms; its punctuality is better than +/– 0.01 ms |
|  | Volts |
|  | Measured samples shall be available as outputs for the screen\_driver no more than 0.1 ms after each sampling moment |
|  | doppler\_input |

1. Below, an image illustrates the life-cycle of real-time software. On the right side of the pyramid, you can find the approximate value of fixing an error in relative units, referenced to the first stage “*Requirement time*”.

Assume that your External Interface Requirements of problem ***A*** contained a critical and non-trivial error, and you noticed and corrected it during the Requirement Time stage. This took only one person hours of your team’s time.

Instead, in a different scenario, considering the error finding during the Acceptance Test, its fixing cost would be approximately 25 – 50 person hours according to the pyramid. *Using your intuition*, write a list of specific tasks in the table below of up to 11 actions that would require the team to make the corrections effective. Each specific task has a costs in person hour (ph), please estimate the approximate value in ph for each task and verify the total.

 

|  |  |  |
| --- | --- | --- |
| ***Q*** | *Specific task* | *Person hour (ph)* |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |
| **11** |  |  |
| **12** | Total |  |