# Stack Depth Analysis Calculation

Stack Depth Analysis is performed on Gateway Application Software. Following sections describe Stack Depth Analysis for application software.

## EDAU Gateway Application Software (H108E-856)

Stack Analysis is performed on following Tasks of Gateway Application Software identified in Requirement H398-SRS-GWY-DRQ-609:

1. Application Task
2. Init Task
3. Idle Task
4. CBIT Task
5. Sound Task
6. A825 Communication Task 1
7. A825 Communication Task 2
8. A429 Task
9. A429 Output Task
10. ETI Timer Task
11. Logic Task
12. Logic Task Com 4

### Stack Depth Analysis Calculations for EDAU Gateway Module Nominal case (TR\_HSIT\_H398\_GWY\_Stack\_Analysis\_nominal.txt & TR\_HSIT\_H398\_GWY\_Stack\_Analysis\_nominal.xlsx)

**Application Task:**

Application Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435837.

Stack Used in % = (325 / 1024) \* 100

= 31.738 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 31.738

= 68.261 %

Stack Used for Application Task is 31.738% and Stack Free is 68.261%

**Init Task:**

Init Task stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435837.

Stack Used in % = (91 / 1024) \* 100

= 8.886 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 8.886

= 91.113 %

Stack Used for Init Task is 8.886% and Stack Free is 91.113%

**Idle Task:**

Idle Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435841.

Stack Used in % = (35 / 512) \* 100

= 6.835 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 6.835

= 93.164 %

Stack Used for Idle Task is 6.835% and Stack Free is 93.164 %

**CBIT Task:**

CBIT Task stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435841.

Stack Used in % = (48 / 512) \* 100

= 9.375 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 9.375

= 90.625%

Stack Used for CBIT Task is 9.375% and Stack Free is 90.625%

**Sound Task:**

Sound Task stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435841.

Stack Used in % = (48 / 1024) \* 100

= 4.687 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 4.687

= 95.312%

Stack Used for CBIT Task is 4.687% and Stack Free is 95.312%

**A825 Communication Task 1:**

A825 Communication Task 1 stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435837.

Stack Used in % = (84 / 1024) \* 100

= 8.203 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 8.203

= 91.796%

Stack Used for A825 Communication Task 1 is 8.203% and Stack Free is 91.796%

**A825 Communication Task 2:**

A825 Communication Task 2 stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435837.

Stack Used in % = (53 / 1024) \* 100

= 5.175 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 5.175

= 94.842%

Stack Used for A825 Communication Task 2 is 5.175% and Stack Free is 94.842%

**A429 Task:**

A429 Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435833.

Stack Used in % = (81 / 1024) \* 100

= 7.910 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 7.910

= 92.089%

Stack Used for A429 Task is 7.910% and Stack Free is 92.089%

**A429 Output Task:**

A429 Output Task stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435833.

Stack Used in % = (61 / 1024) \* 100

= 5.957 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 5.957

= 94.042%

Stack Used for A429 Output Task is 5.957% and Stack Free is 94.042%

**ETI Timer Task:**

ETI Timer Task stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435841.

Stack Used in % = (47 / 256) \* 100

= 18.359 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 18.359

= 81.64%

Stack Used for ETI Timer Task is 18.359% and Stack Free is 81.64%

**Logic Task:**

Logic Task stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435833.

Stack Used in % = (289 / 1024) \* 100

= 28.222 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 28.222

= 71.777%

Stack Used for Logic Task is 28.222% and Stack Free is 71.777%

**Logic Task Com 4:**

Logic Task Com 4 stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435833.

Stack Used in % = (49 / 2048) \* 100

= 2.392 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 2.392

= 97.068%

Stack Used for Logic Task Com 4 is 2.392% and Stack Free is 97.068%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No** | **Task** | **Maximum Stack Size** | **Maximum Stack Index Obtained from Log Files** | **Stack usage in percentage** |
| 1 | Application Task | 1024 | 325 | 31.738 |
| 2 | Init Task | 1024 | 91 | 8.886 |
| 3 | Idle Task | 512 | 35 | 6.835 |
| 4 | CBIT Task | 512 | 48 | 9.375 |
| 5 | Sound Task | 1024 | 48 | 4.687 |
| 6 | A825 Communication Task 1 | 1024 | 84 | 8.203 |
| 7 | A825 Communication Task 2 | 1024 | 53 | 5.175 |
| 8 | A429 Task | 1024 | 81 | 7.910 |
| 9 | A429 Output Task | 1024 | 61 | 5.957 |
| 10 | ETI Timer Task | 256 | 47 | 18.359 |
| 11 | Logic Task | 1024 | 289 | 28.222 |
| 12 | Logic Task Com 4 | 2048 | 49 | 2.392 |

Table 1.1

### Stack Depth Analysis Calculations for EDAU Gateway Module Worst case (TR\_HSIT\_H398\_GWY\_Stack\_Analysis\_worst.txt & TR\_HSIT\_H398\_GWY\_Stack\_Analysis\_worst.xlsx)

**Application Task:**

Application Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435837.

Stack Used in % = (327 / 1024) \* 100

= 31.933 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 31.933

= 68.066%

Stack Used for Application Task is 31.933% and Stack Free is 68.066%

**Init Task:**

Init Task stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435837.

Stack Used in % = (91 / 1024) \* 100

= 8.886 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 8.886

= 91.113 %

Stack Used for Init Task is 8.886% and Stack Free is 91.113%

**Idle Task:**

Idle Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435841.

Stack Used in % = (35 / 512) \* 100

= 6.835 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 6.835

= 93.164 %

Stack Used for Idle Task is 6.835% and Stack Free is 93.164 %

**CBIT Task:**

CBIT Task stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435841.

Stack Used in % = (48 / 512) \* 100

= 9.375 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 9.375

= 90.625%

Stack Used for CBIT Task is 9.375% and Stack Free is 90.625%

**Sound Task:**

Sound Task stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435841.

Stack Used in % = (48 / 1024) \* 100

= 4.687 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 4.687

= 95.312%

Stack Used for CBIT Task is 4.687% and Stack Free is 95.312%

**A825 Communication Task 1:**

A825 Communication Task 1 stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435837.

Stack Used in % = (85 / 1024) \* 100

= 8.300 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 8.300

= 91.699%

Stack Used for A825 Communication Task 1 is 8.300% and Stack Free is 91.699%

**A825 Communication Task 2:**

A825 Communication Task 2 stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435837.

Stack Used in % = (53 / 1024) \* 100

= 5.175 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 5.175

= 94.824%

Stack Used for A825 Communication Task 2 is 5.175% and Stack Free is 94.824%

**A429 Task:**

A429 Task stack index is logged in byte 1 and 2 of payload in CAN Message ID 156435833.

Stack Used in % = (81 / 1024) \* 100

= 7.91 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 7. 91

= 92.089%

Stack Used for A429 Task is 7. 91% and Stack Free is 92.089%

**A429 Output Task:**

A429 Output Task stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435833.

Stack Used in % = (61 / 1024) \* 100

= 5.957 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 5.957

= 94.042%

Stack Used for A429 Output Task is 5.957% and Stack Free is 94.042%

**ETI Timer Task:**

ETI Timer Task stack index is logged in byte 3 and 4 of payload in CAN Message ID 156435841.

Stack Used in % = (47 / 256) \* 100

= 18.359 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 18.359

= 81.640%

Stack Used for ETI Timer Task is 18.359% and Stack Free is 81.640%

**Logic Task:**

Logic Task stack index is logged in byte 5 and 6 of payload in CAN Message ID 156435833.

Stack Used in % = (342 / 1024) \* 100

= 33.398 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 33.398

= 66.601%

Stack Used for Logic Task is 33.398% and Stack Free is 66.601%

**Logic Task Com 4:**

Logic Task Com 4 stack index is logged in byte 7 and 8 of payload in CAN Message ID 156435833.

Stack Used in % = (49 / 2048) \* 100

= 2.392 %

Stack Free in % = 100 – (Stack Used in %)

= 100 – 2.44

= 97.607%

Stack Used for Logic Task Com 4 is 2.392% and Stack Free is 97.607%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No** | **Task** | **Maximum Stack Size** | **Maximum Stack Index Obtained from Log Files** | **Stack usage in percentage** |
| 1 | Application Task | 1024 | 327 | 31.933 |
| 2 | Init Task | 1024 | 91 | 8.886 |
| 3 | Idle Task | 512 | 35 | 6.835 |
| 4 | CBIT Task | 512 | 48 | 9.375 |
| 5 | Sound Task | 1024 | 48 | 4.687 |
| 6 | A825 Communication Task 1 | 1024 | 85 | 8.300 |
| 7 | A825 Communication Task 2 | 1024 | 53 | 5.175 |
| 8 | A429 Task | 1024 | 81 | 7.910 |
| 9 | A429 Output Task | 1024 | 61 | 5.957 |
| 10 | ETI Timer Task | 256 | 47 | 18.359 |
| 11 | Logic Task | 1024 | 342 | 33.398 |
| 12 | Logic Task Com 4 | 2048 | 49 | 2.392 |

Table 1.2

# 2. Stack Depth Analysis Result

## 2.1 Gateway Application Software (H108E-856) Summary

Summary of Stack Depth Analysis Results for each task of Gateway Application Software (H108E-856) considering the maximum stack usage index out of all the engines.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No** | **Task** | **Maximum Stack Size** | **Maximum Stack Index Obtained from Log Files** | **Stack usage in percentage** |
| 1 | Application Task | 1024 | 327 | 31.933 |
| 2 | Init Task | 1024 | 91 | 8.886 |
| 3 | Idle Task | 512 | 35 | 6.835 |
| 4 | CBIT Task | 512 | 48 | 9.375 |
| 5 | Sound Task | 1024 | 48 | 4.687 |
| 6 | A825 Communication Task 1 | 1024 | 85 | 8.300 |
| 7 | A825 Communication Task 2 | 1024 | 53 | 5.175 |
| 8 | A429 Task | 1024 | 81 | 7.910 |
| 9 | A429 Output Task | 1024 | 61 | 5.957 |
| 10 | ETI Timer Task | 256 | 47 | 18.359 |
| 11 | Logic Task | 1024 | 342 | 33.398 |
| 12 | Logic Task Com 4 | 2048 | 49 | 2.392 |

Table 2.1