**UDDT Name Goes Here**

|  |  |
| --- | --- |
| **Version** | **Release Notes** |
| 1.0 | Initial Release |

**Description**:

This UDT is used to convert a timer value from milliseconds to hours, minutes, and seconds for readable display on the HMI. Based on the mode, the value can either be calculated as the time remaining or the runtime.

**Naming Convention**:

No specific naming guidelines exist currently. Programmers should follow the SCADA standards and seek guidance from the SCADA group as required.

**UDT Members**

| **UDT Member** | **Datatype** | **Description** | **Usage** |
| --- | --- | --- | --- |
| ADDON | Timer\_Display\_V1 | Timer Display Calculation AOI | Used in conjunction with a timer |
| AI\_HS | DINT | Hours Component of Time Display | For use on HMI |
| AI\_MS | DINT | Minutes Component of Time Display | For use on HMI |
| AI\_SN | DINT | Seconds Component of Time Display | For Use on HMI |

**AOI**

| **AOI Parameter** | **Requirement** | **Default Value** | **Description** | **Implementation Guideline** |
| --- | --- | --- | --- | --- |
| Timer\_Display\_V1 | Mandatory | *Tagname*.ADDON | Add-on Instruction | N/A |
| Timer | Mandatory | Map the Timer Tag for Which the Calculation is being performed | Timer for Display Calculation | N/A |
| Mode | Optional | *Tagname*.ADDON.Mode | Time Calculation Mode | 0 = Time Remaining  1 = Runtime |
| Hour | Mandatory | *Tagname*.AI\_HS | Hour Component of Timer | N/A |
| Minute | Mandatory | *Tagname*.AI\_MS | Minute Component of Timer | N/A |
| Second | Mandatory | *Tagname*.AI\_SS | Second Component of Timer | N/A |

**AOI Operation Description**

If the mode is configured for time remaining, the AOI will subtract the accumulated timer value from the pre-set value to determine the time remaining. Otherwise the outputs will be calculated using the accumulated timer value.

The display components of the timer are computed using a series of modular arithmetic instructions and division results being moved into DINT instructions to preserve the quotient without any rounding.

Hours = Time / 3600000

Minutes = (Time Mod 3600000) / 60000

Seconds = (Time Mod 60000) / 1000

**Programming Examples**

This instruction is primarily intended for step sequencing or timer-based events on the HMI to translate the timing function in the PLC into a more readable format for the operator.

This instruction is compatible with either a TOF or TON instruction. It is the responsibility of the programmer to ensure that they use the instruction appropriate to their application and that the resultant calculation of the display time performs in the expected manner (e.g. move on to the next step when a countdown timer reaches 0).