



easYgen-XT Series

Periodic ECU-Powerup
Optional Supplementary Information

General Information

The following alert boxes can be used in this publication:



“DANGER” indicates a hazardous situation which, if not avoided, will result in death or serious injury.



“WARNING” indicates a hazardous situation which, if not avoided, could result in death or serious injury.



“CAUTION”, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

“NOTICE” is used to address practices not related to personal injury.

IMPORTANT

“IMPORTANT” is used to address practices not related to personal injury.

Personnel



WARNING!
Hazards due to insufficiently qualified personnel!

If unqualified personnel perform work on or with the control unit hazards may arise which can cause serious injury and substantial damage to property.

- **Therefore, all work must only be carried out by appropriately qualified personnel.**

For further Product Support Options, Product Service Options, Returning Equipment for Repair, and/or Engineering Services please [download application note #37573](#).

Documentation itself

 **WARNING**

Read this entire application note and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage!

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment.

Any such unauthorized modifications: constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and invalidate product certifications or listings.

 **CAUTION**

This publication may have been revised or updated since this copy was produced. If the cover of the publication states "Translation of the Original Instructions", the original source may have been updated since this translation was made.

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Table of Contents

| | |
|---|----|
| General Information..... | 2 |
| Personnel..... | 2 |
| Documentation itself..... | 3 |
| 1 Introduction..... | 5 |
| 2 Configuration of flexible limits (same setting for all examples)..... | 5 |
| 3 Configuration on/off periodical (different examples)..... | 6 |
| 3.1. Power up only once a day at a full hour:..... | 6 |
| 3.2 Power up twice a day at full hours:..... | 8 |
| 3.3 Power up every full hour..... | 10 |
| 3.4 Power up every two full hours..... | 10 |
| 3.5 Power up free defined cycle..... | 10 |
| 4 J1939 ECU interface monitoring..... | 11 |
| 5 Indication of the time since last power up..... | 11 |

1 Introduction

In some application the Engine Control Unit (ECU) shall be powered down if the generator is not requested. This is to economize battery power.

If the ECU is powered down, the ECU is not able to send any J1939 CAN messages to the easYgen. Thus the easYgen cannot trigger any alarm, if there is e.g. a coolant leakage it is not possible to detect this until the ECU is requested and powered up.

This application note gives some examples how the easYgen could be configured to power up the ECU periodically to detect a coolant leakage.

In all examples relay 12 is used to power up the ECU. This relay must be connected parallel to the relay which powers up the ECU in normal operation (e.g. Fuel solenoid).

NOTICE

If the ECU is powered down the visualized ECU values becomes lost after ca. 10s. (They are not latched.) Naturally a CAN interface timeout monitoring is not possible if the ECU is powered down.

2 Configuration of flexible limits (same setting for all examples)

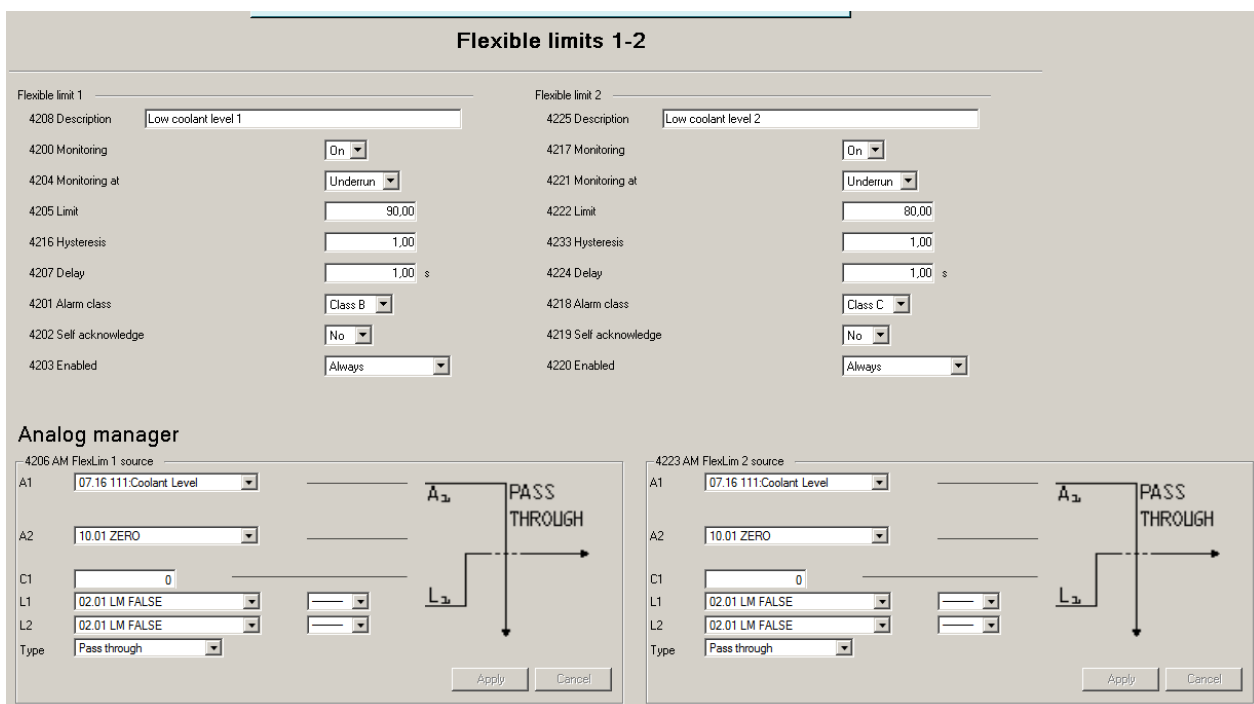
Coolant level is monitored at two levels.

Flexible limits 1 and 2 are taken to monitor coolant level via J1939 data SPN 111 which is represented by the analog variable “AM 07.16 111:Coolant Level”

Flexible limit 1 named “**Low coolant level 1**” is configured to alarm class B and shall trip if the coolant level underruns 90 %.

Flexible limit 2 named “**Low coolant level 2**” is configured to alarm class C and shall trip if the coolant level underruns 80 %.

Self acknowledge is configured to “No” at both limits. (This is that the alarm remains tripped if the ECU is powered down again.)



3 Configuration on/off periodical (different examples)

3.1. Power up only once a day at a full hour:

The ECU shall be powered only once a day at 11 a.m. for 2 minutes (= 120000 ms).

Configure “Active hour” (1662) to 11. Thus the command variable “11.05 Active hour” becomes true every day at 11 a.m. for one hour.

Configure LogicsManager

Set timers

| | |
|--|--|
| <p>Timer 1</p> <p>1652 Timer 1: Hour <input style="width: 50px;" type="text" value="8"/> h</p> <p>1651 Timer 1: Minute <input style="width: 50px;" type="text" value="0"/> min</p> <p>1650 Timer 1: Second <input style="width: 50px;" type="text" value="0"/> s</p> <p>Timer 2</p> <p>1657 Timer 2: Hour <input style="width: 50px;" type="text" value="17"/> h</p> <p>1656 Timer 2: Minute <input style="width: 50px;" type="text" value="0"/> min</p> <p>1655 Timer 2: Second <input style="width: 50px;" type="text" value="0"/> s</p> <p>1663 Active day <input style="width: 50px;" type="text" value="1"/></p> <p>1662 Active hour <input style="width: 50px;" type="text" value="11"/> h</p> <p>1661 Active minute <input style="width: 50px;" type="text" value="1"/> min</p> <p>1660 Active second <input style="width: 50px;" type="text" value="0"/> s</p> | <p>Active weekdays</p> <p>1670 Monday active <input type="button" value="Yes"/> ▾</p> <p>1671 Tuesday active <input type="button" value="Yes"/> ▾</p> <p>1672 Wednesday active <input type="button" value="Yes"/> ▾</p> <p>1673 Thursday active <input type="button" value="Yes"/> ▾</p> <p>1674 Friday active <input type="button" value="Yes"/> ▾</p> <p>1675 Saturday active <input type="button" value="No"/> ▾</p> <p>1676 Sunday active <input type="button" value="No"/> ▾</p> |
|--|--|

Take an AM Internal value, select the function “One Shot”, set L1 to “11.05 Active hour” and set C1 to 120000 ms (2 minutes).

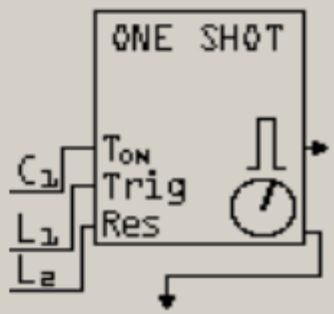
Now the binary output of this AM will become true every day at 11 o'clock for 2 minutes.

AM Internal value 1

9641 Description

9640 AM Internal value 1

| | | |
|------|--|----------------------|
| A1 | <input type="text" value="10.01 ZERO"/> | |
| A2 | <input type="text" value="10.01 ZERO"/> | |
| C1 | <input type="text" value="1200000"/> | |
| L1 | <input type="text" value="11.05 Active hour"/> | <input type="text"/> |
| L2 | <input type="text" value="02.01 LM FALSE"/> | <input type="text"/> |
| Type | <input type="text" value="One Shot"/> | |



Output

9643 91.01 AM Internal value 1

9642 91.01 AM Internal value 1

In all examples relay 12 is used to power up the ECU. This relay must be connected parallel to the relay which powers up the ECU in normal operation (e.g. Fuel solenoid). This relay is controlled by the command variable "91.01 AM Internal value 1"

12590 Relay 12 - LogicsManager

| | | |
|--|-----------------------------------|-----|
| <input type="text" value="91.01 AM Internal value 1"/> | <input type="text"/> | And |
| <input type="text" value="02.01 LM FALSE"/> | <input type="text" value="True"/> | |
| <input type="text" value="02.01 LM FALSE"/> | <input type="text" value="True"/> | And |

Timing

Delay ON s

Delay OFF s

3.2 Power up twice a day at full hours:

In this example the ECU is powered up for 2 minutes at 11 a.m. and 11 p.m.

Configure “Active hour” (1662) to 11. Thus the command variable “11.05 Active hour” becomes true every day at 11 a.m. for one hour.

Configure LogicsManager

Set timers

| | |
|--|--|
| <p>Timer 1</p> <p>1652 Timer 1: Hour <input style="width: 50px;" type="text" value="8"/> h</p> <p>1651 Timer 1: Minute <input style="width: 50px;" type="text" value="0"/> min</p> <p>1650 Timer 1: Second <input style="width: 50px;" type="text" value="0"/> s</p> <p>Timer 2</p> <p>1657 Timer 2: Hour <input style="width: 50px;" type="text" value="17"/> h</p> <p>1656 Timer 2: Minute <input style="width: 50px;" type="text" value="0"/> min</p> <p>1655 Timer 2: Second <input style="width: 50px;" type="text" value="0"/> s</p> <p>1663 Active day <input style="width: 50px;" type="text" value="1"/></p> <p>1662 Active hour <input style="width: 50px;" type="text" value="11"/> h</p> <p>1661 Active minute <input style="width: 50px;" type="text" value="1"/> min</p> <p>1660 Active second <input style="width: 50px;" type="text" value="0"/> s</p> | <p>Active weekdays</p> <p>1670 Monday active <input type="button" value="Yes"/></p> <p>1671 Tuesday active <input type="button" value="Yes"/></p> <p>1672 Wednesday active <input type="button" value="Yes"/></p> <p>1673 Thursday active <input type="button" value="Yes"/></p> <p>1674 Friday active <input type="button" value="Yes"/></p> <p>1675 Saturday active <input type="button" value="No"/></p> <p>1676 Sunday active <input type="button" value="No"/></p> |
|--|--|

For the 2nd power up a delay time must be defined. In the example the time should be 12 h (=43200000 ms). The power up at 11 a.m. is done like example 1.

For power up at 11 p.m. an “One Shot” of 12 h (C1 = 43200000 ms) is triggered with “AM Internal value 2”.

L1 of “AM Internal value 3” is assigned **inverted** to the binary output of “AM Internal value 2” is “91.02 AM. C1 is set to 120000 ms.

Configure AnalogManager

AM Internal value 1

9641 Description: Power up ECU 11h am

9640 AM Internal value 1

A1: 10.01 ZERO

A2: 10.01 ZERO

C1: 120000

L1: 11.05 Active hour

L2: 02.01 LM FALSE

Type: One Shot

Apply Cancel

Output 9643 91.01 AM Internal value 1

9642 91.01 AM Internal value 1 0.00

AM Internal value 3

9649 Description: Power up ECU 11h pm

9648 AM Internal value 3

A1: 10.01 ZERO

A2: 10.01 ZERO

C1: 120000

L1: 91.02 AM Internal value 2

L2: 02.01 LM FALSE

Type: One Shot

Apply Cancel

Output 9651 91.03 AM Internal value 3

9650 91.03 AM Internal value 3 0.00

AM Internal value 2

9645 Description: One Shot12h

9644 AM Internal value 2

A1: 10.01 ZERO

A2: 10.01 ZERO

C1: 4.32E+07

L1: 11.05 Active hour

L2: 02.01 LM FALSE

Type: One Shot

Apply Cancel

Output 9647 91.02 AM Internal value 2

9646 91.02 AM Internal value 2 0.00

AM Internal value 4

9653 Description: AM Internal Value 4

9652 AM Internal value 4

A1: 10.01 ZERO

A2: 10.01 ZERO

C1: 0

L1: 02.01 LM FALSE

L2: 02.01 LM FALSE

Type: Pass through

Apply Cancel

Output 9655 91.04 AM Internal value 4

9654 91.04 AM Internal value 4 0.00

Relay 12 is assigned to “AM Internal value 1” for 11 a.m. and to “AM Internal value 3” for 11 p.m.:

12590 Relay 12 - LogicsManager

The logic diagram shows three input conditions: "91.01 AM Internal value 1", "91.03 AM Internal value 3", and "02.01 LM FALSE". The first two are connected to an "Or" gate, and the result of the "Or" gate is connected to an "And" gate along with the "02.01 LM FALSE" input. The output of the "And" gate is connected to a "Timing" block with "Delay ON" and "Delay OFF" both set to 0.00 s.

OK Cancel

3.3 Power up every full hour

Take the same configuration like example 1 with the following exceptions:

- set the minute you want to power up the ECU parameter 1661 (set 0 for full hour)
- Set L1 of AM Internal value 1 to "11.06 Active minute"

3.4 Power up every two full hours

There is a very easy way to do this:

Take the setting for flexible limits from example 1.

- Set L1 of AM Internal value 1 to "11.08 Engine 1h"

This flag toggles every full hour, it has a rising edge every two hours which triggers the One Shot

3.5 Power up free defined cycle

In this example the ECU is powered up for **2 minutes every 3 h.**

"AM Internal value 3" defines the 2 minutes **on-time** "ECU time on [ms]" (12000 ms)

"AM Internal value 2" defines the **off-time** "ECU time off [ms]" . 3 h = 10800000 ms.

Off-time = 3h – 2 min = 10800000 ms-120000 ms = 10680000 ms

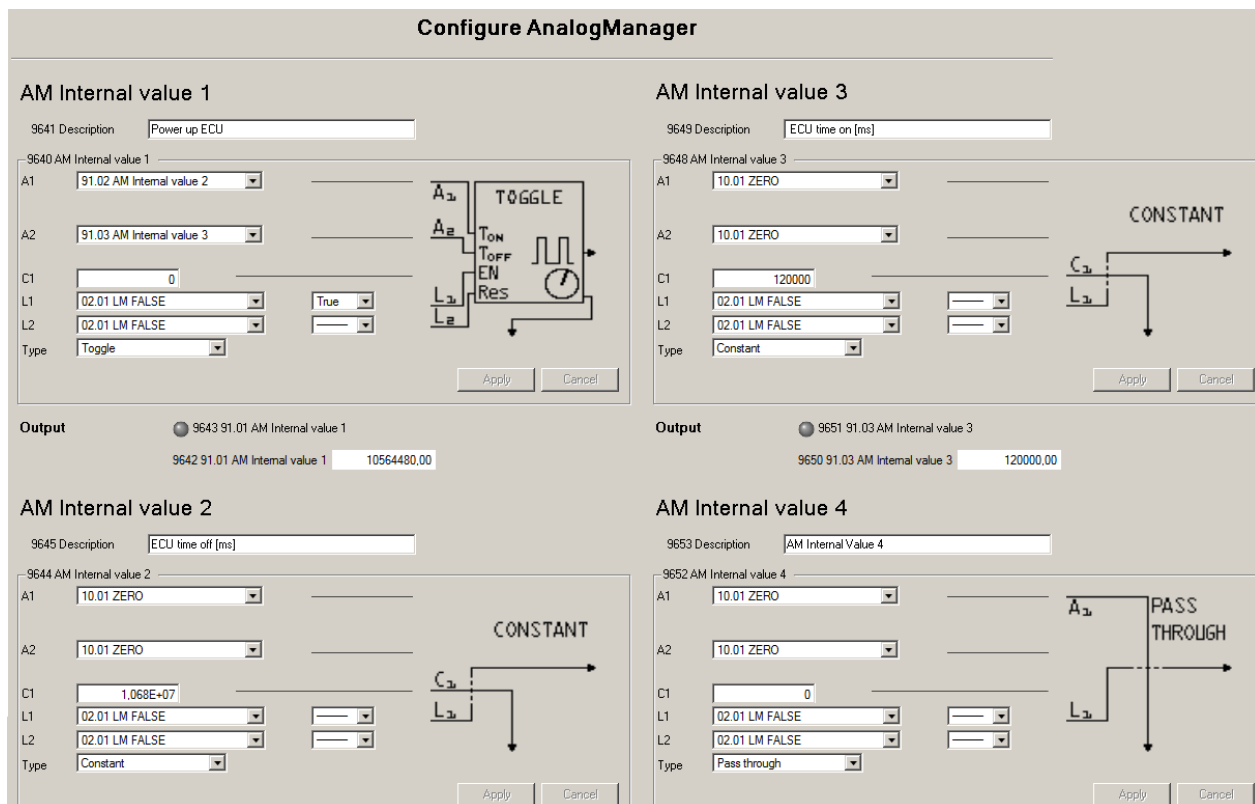
"AM Internal value 1" is set to Type = Toggle.

A1 (Delay On Time) is set to "AM Internal value 2" ("ECU time off [ms]").

A2 (Delay Off Time) is set to "AM Internal value 2" ("ECU time on [ms]").

L1 the enable input is set to constant true.

The binary output of "91.01 AM Internal value 1" is used to control the relay.



The screenshot displays the 'Configure AnalogManager' interface with four configuration panels for AM Internal values:

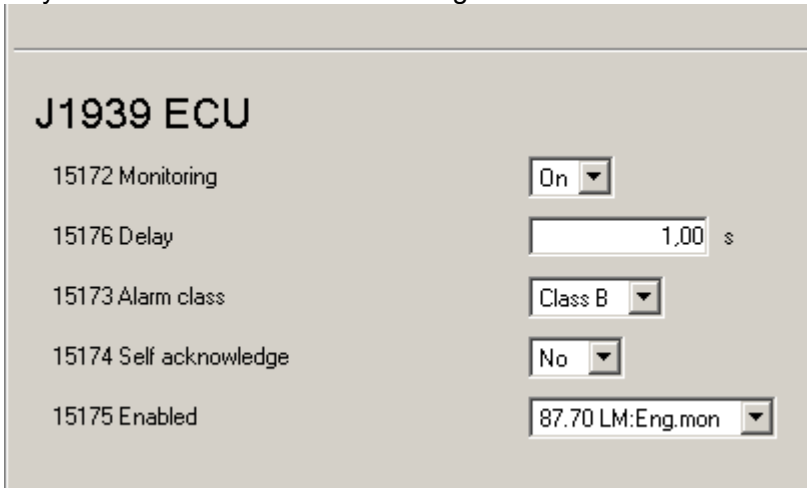
- AM Internal value 1 (9641):** Description 'Power up ECU'. A1 is '91.02 AM Internal value 2', A2 is '91.03 AM Internal value 3', C1 is '0', L1 and L2 are '02.01 LM FALSE'. Type is 'Toggle'. The output diagram shows a 'TOGGLE' block with inputs A1, A2, L1, and L2, and outputs TON, TOFF, EN, and Res.
- AM Internal value 3 (9649):** Description 'ECU time on [ms]'. A1 and A2 are '10.01 ZERO', C1 is '120000', L1 and L2 are '02.01 LM FALSE'. Type is 'Constant'. The output diagram shows a 'CONSTANT' block with inputs C1 and L1, and output Res.
- AM Internal value 2 (9645):** Description 'ECU time off [ms]'. A1 and A2 are '10.01 ZERO', C1 is '1.068E+07', L1 and L2 are '02.01 LM FALSE'. Type is 'Constant'. The output diagram shows a 'CONSTANT' block with inputs C1 and L1, and output Res.
- AM Internal value 4 (9653):** Description 'AM Internal Value 4'. A1 and A2 are '10.01 ZERO', C1 is '0', L1 and L2 are '02.01 LM FALSE'. Type is 'Pass through'. The output diagram shows a 'PASS THROUGH' block with inputs A1 and L1, and output Res.

Below the configurations, the 'Output' section shows:

- 9643 91.01 AM Internal value 1: 10564480.00
- 9651 91.03 AM Internal value 3: 120000.00

4 J1939 ECU interface monitoring

To avoid wrong J1939 CAN interface timeout errors, the J1939 ECU monitoring must be switched off or only be enabled with “87.70” LM: Eng.mon”:



J1939 ECU

| | |
|------------------------|------------------|
| 15172 Monitoring | On |
| 15176 Delay | 1.00 s |
| 15173 Alarm class | Class B |
| 15174 Self acknowledge | No |
| 15175 Enabled | 87.70 LM:Eng.mon |

5 Indication of the time since last power up

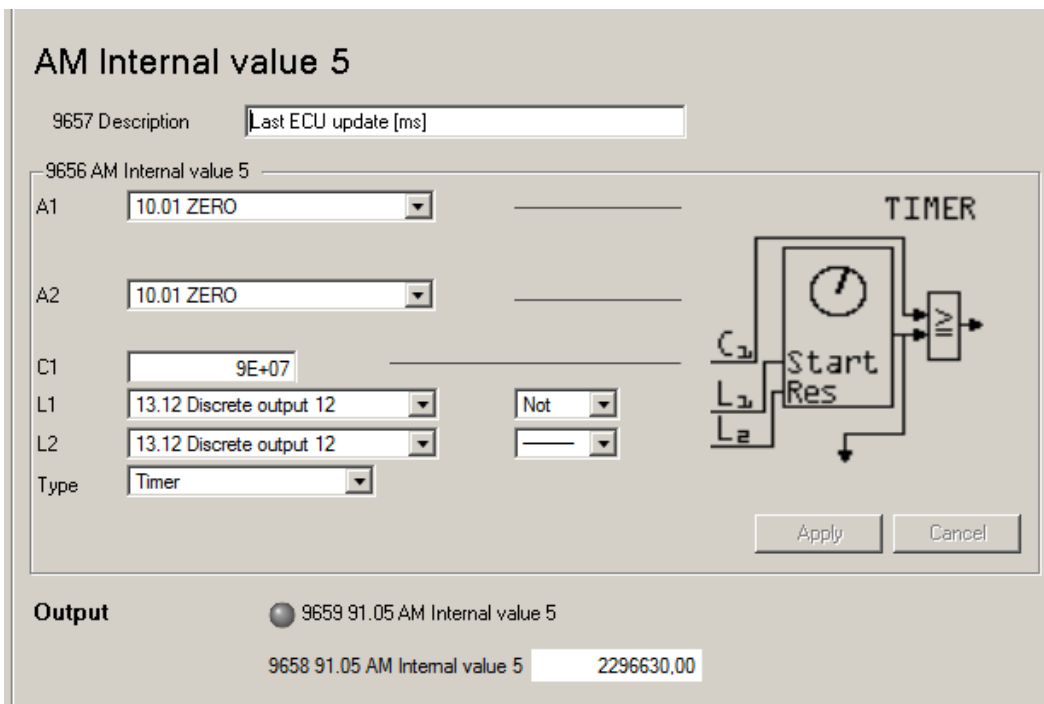
The time period for power cycle is known and the events have a time stamp. For this reason in most cases it would not be necessary to add an additional timer to calculate the time since last power on (update). But if required it could be realized with Analogmanagers and the customer screen e.g. with the following configuration:

At first a timer is realized with “AM Internal value 5”. It is supposed that the period time is max. 24.

To avoid any overrun the time is set to 25h (C1 = 90000000 ms).

The timer is starting if the ECU is powered down. In our examples if “13.12 Discrete output 12” (relay 12) becomes **false**.

The timer will be reset if “13.12 Discrete output 12” becomes true.



AM Internal value 5

9657 Description: Last ECU update [ms]

9656 AM Internal value 5

| | | |
|------|--------------------------|-----|
| A1 | 10.01 ZERO | |
| A2 | 10.01 ZERO | |
| C1 | 9E+07 | |
| L1 | 13.12 Discrete output 12 | Not |
| L2 | 13.12 Discrete output 12 | |
| Type | Timer | |

TIMER diagram: A box labeled 'TIMER' contains a clock icon and 'Start' and 'Res' labels. Inputs C1, L1, and L2 are shown on the left. An output labeled 'IV' is shown on the right.

Output

9659 91.05 AM Internal value 5

9658 91.05 AM Internal value 5: 2296630.00

“AM Costumer screen 1” is used to visualized the time. The conversion of the output signal of “AM Internal value 5” which is in milliseconds to hour is done by this analogmanager too.

The function “Divide” is configured.

The source A1 is set to 91.05 AM Internal value 5.

A2 is set to “10.02 ONE” (= constant 1).

To convert ms to h the value in ms must be divided by 3600000. The reciprocal of 3600000 is 2,777778E-07. The source is multiplied with

C1 = 2,777778E-07.

(The multiplication with the reciprocal is not such intuitive. But otherwise an additional analogmanager must be used to define the constant 3600000 for A2.)

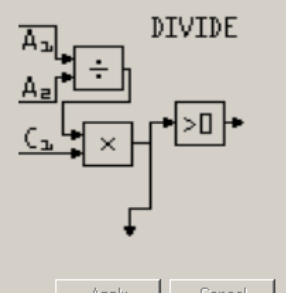
AM Customer screen 1.1

7691 Description

7692 Unit

Analog manager

7690 AM Customer screen 1.1

| | | | |
|------|--|--|--|
| A1 | <input style="width: 90%;" type="text" value="91.05 AM Internal value 5"/> | |  <p style="font-size: small; margin: 0;">The diagram shows a 'DIVIDE' block with inputs A1 and A2. The output of the divide block goes into a multiplication block with input C1. The final output is shown in a box with a greater-than sign.</p> |
| A2 | <input style="width: 90%;" type="text" value="10.02 ONE"/> | | |
| C1 | <input style="width: 90%;" type="text" value="2,777778E-07"/> | | |
| L1 | <input style="width: 90%;" type="text" value="02.01 LM FALSE"/> | <input style="width: 30px;" type="text" value=""/> | |
| L2 | <input style="width: 90%;" type="text" value="02.01 LM FALSE"/> | <input style="width: 30px;" type="text" value=""/> | |
| Type | <input style="width: 90%;" type="text" value="Divide"/> | | |

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