APPLICATION NOTE
#37664, 10/2016

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

“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

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.

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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).

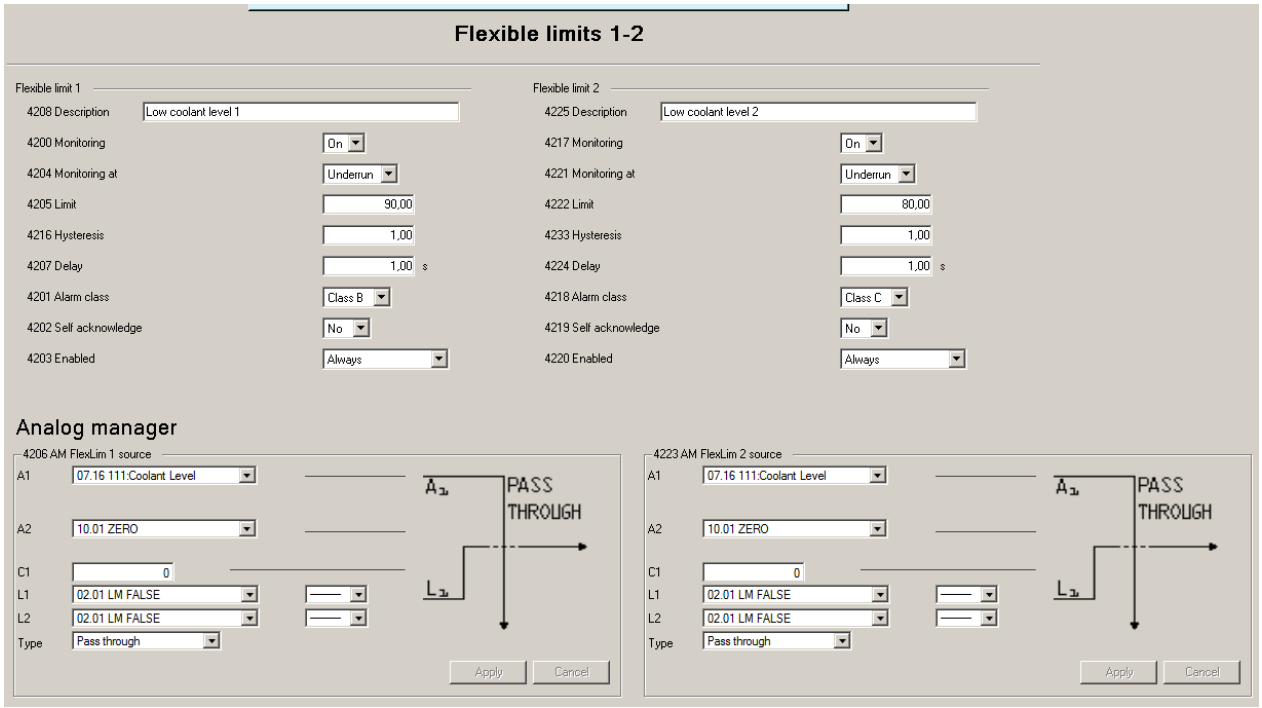
NOTICE

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 whhich 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.)

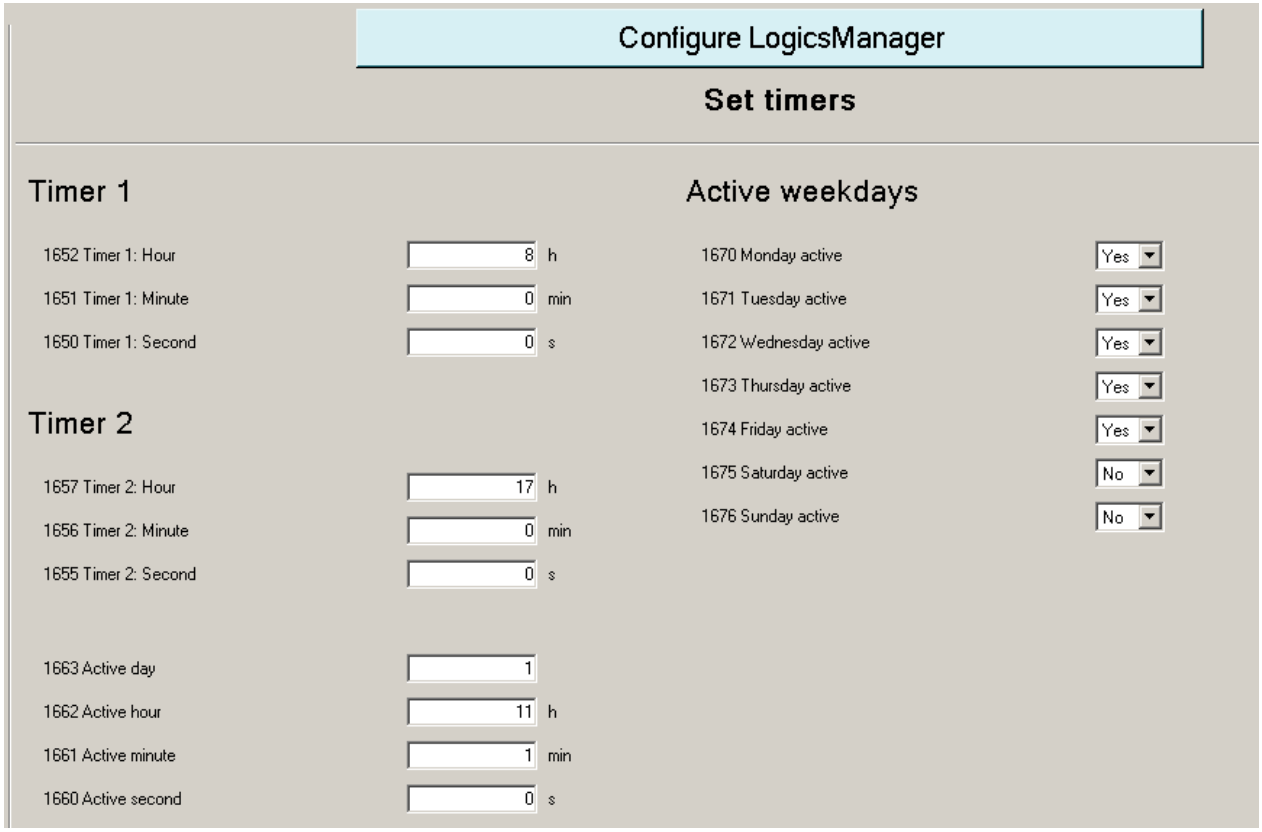


3 Configuration on/off periodical (different examples)

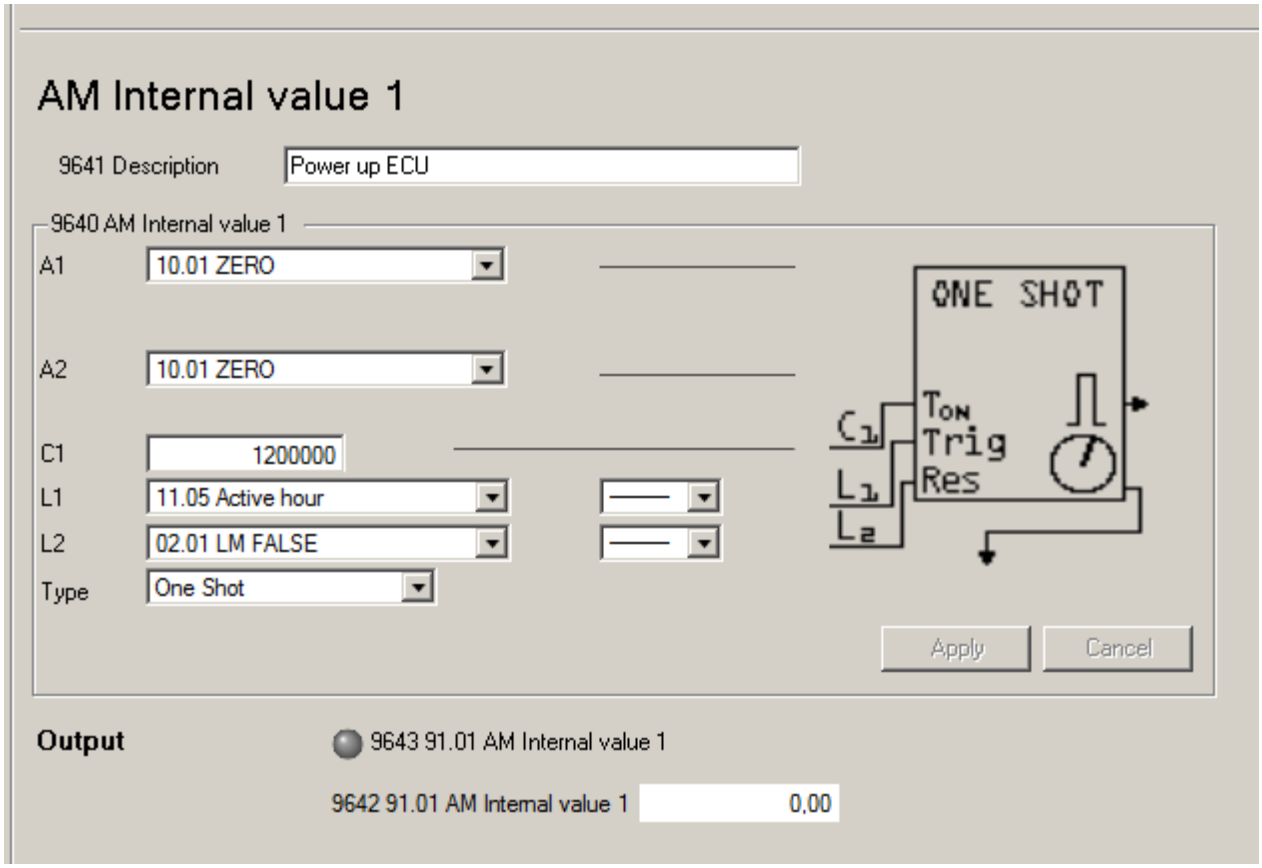
3.1. Power up only once a day at a full hour:

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

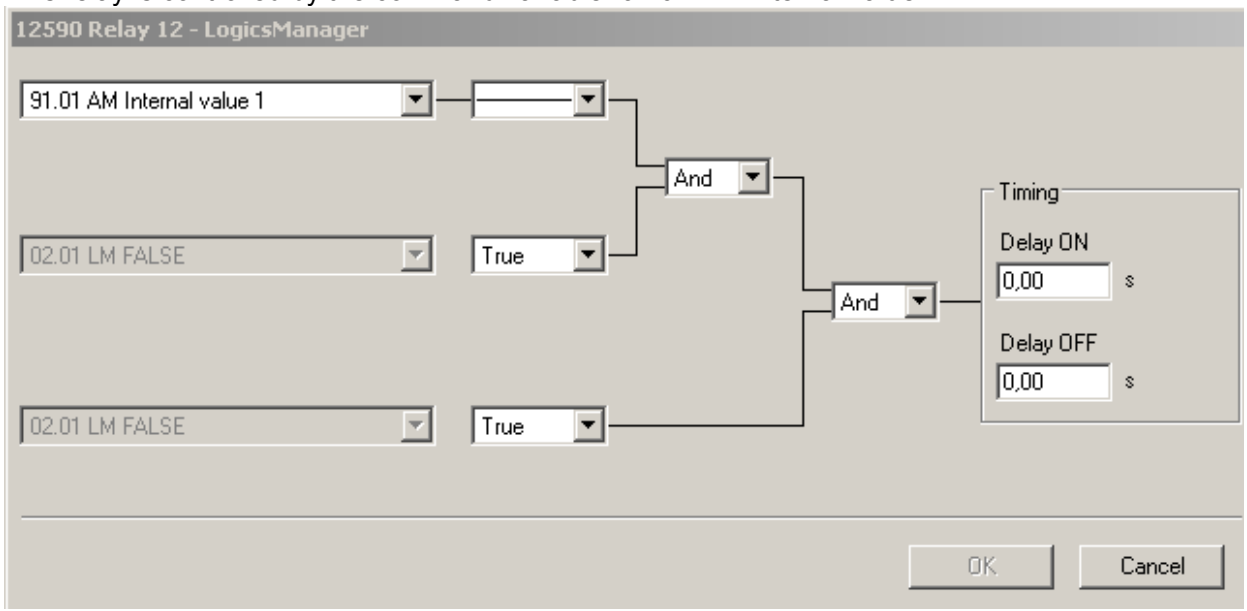
Configure “Active hour” (1662) to 11. Thus the command variable “11.05 Active hour” becomes true every day at 11 a.m. for one hour.



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.

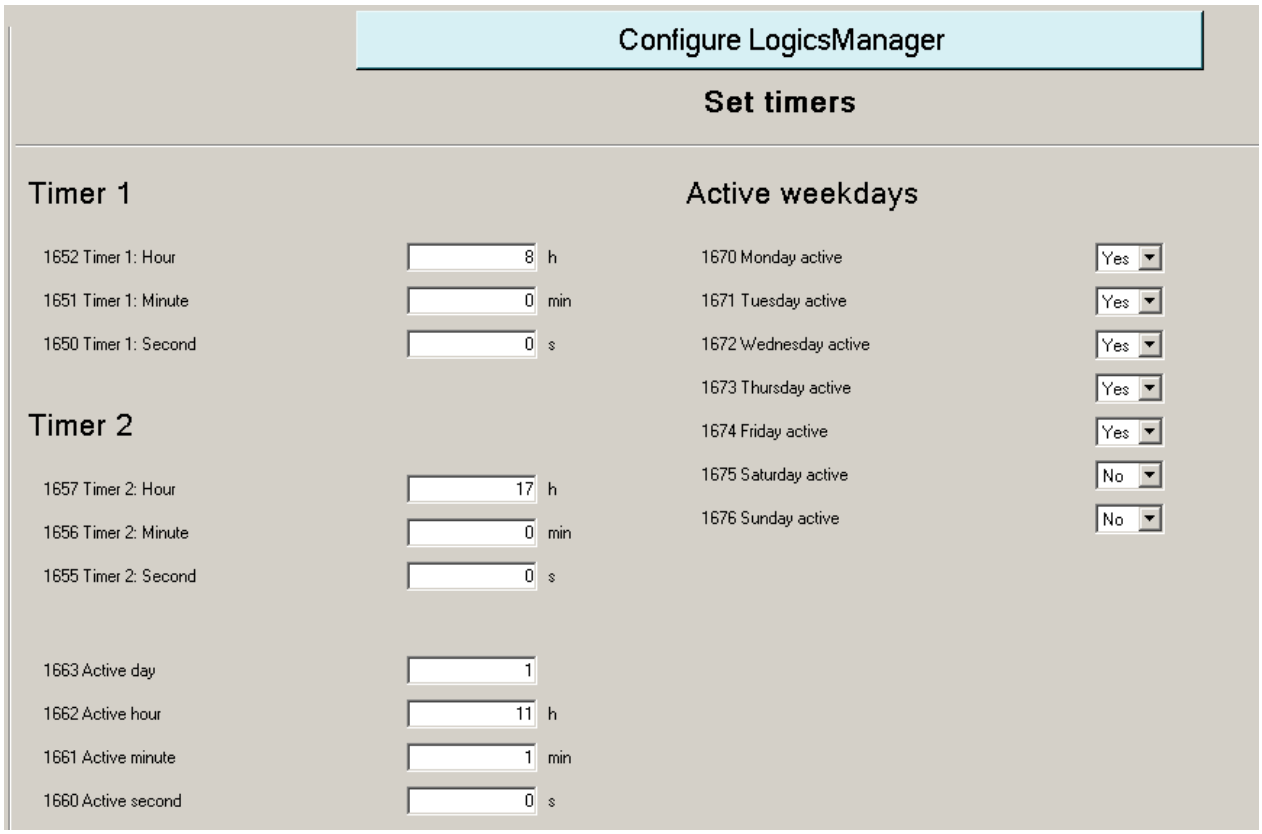


In all examples relay 12 is used to power up the ECU. This relay must be connected parallel to the relay which powers up the ECU in normal operation (e.g. Fuel solenoid).
This relay is controlled by the command variable “91.01 AM Internal value 1”



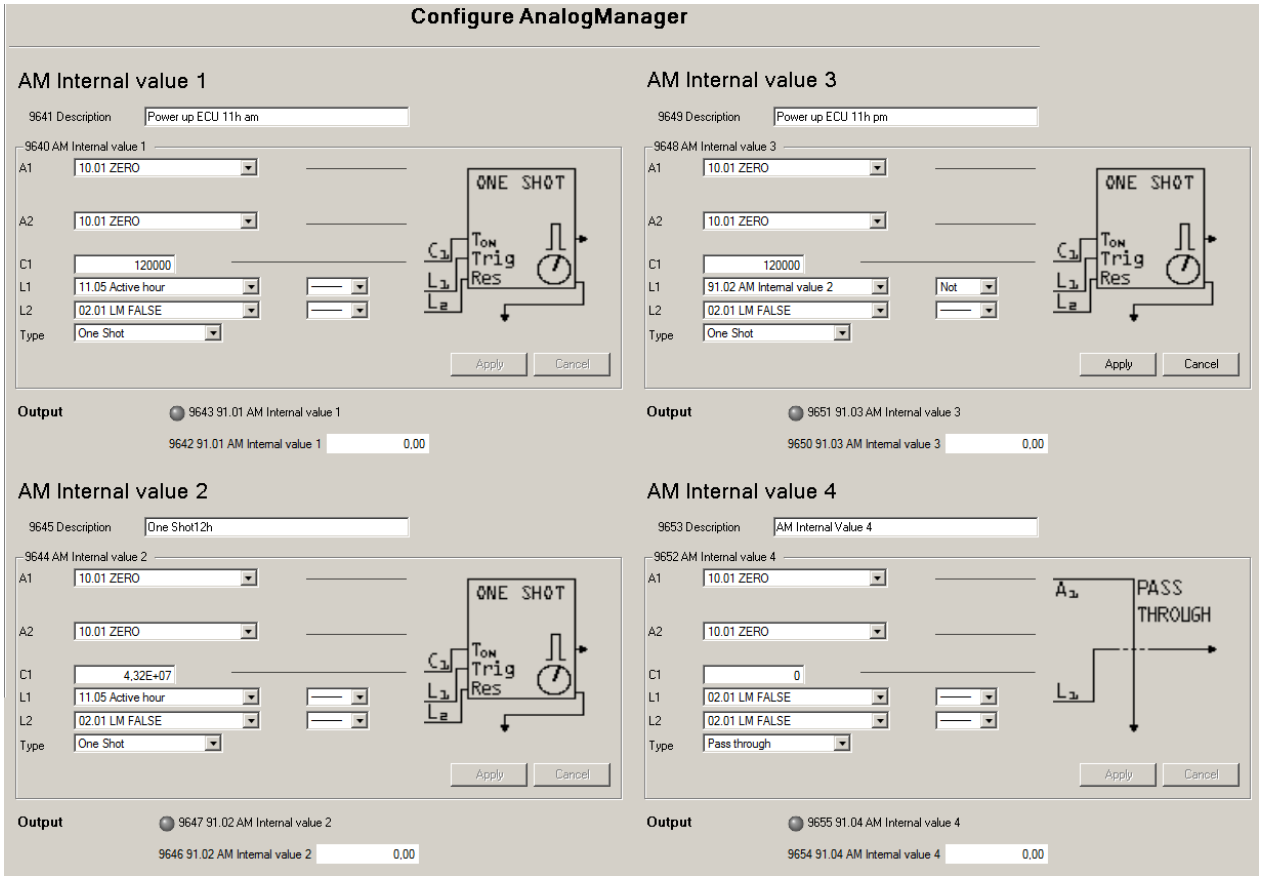
3.2 Power up twice a day at full hours:

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.

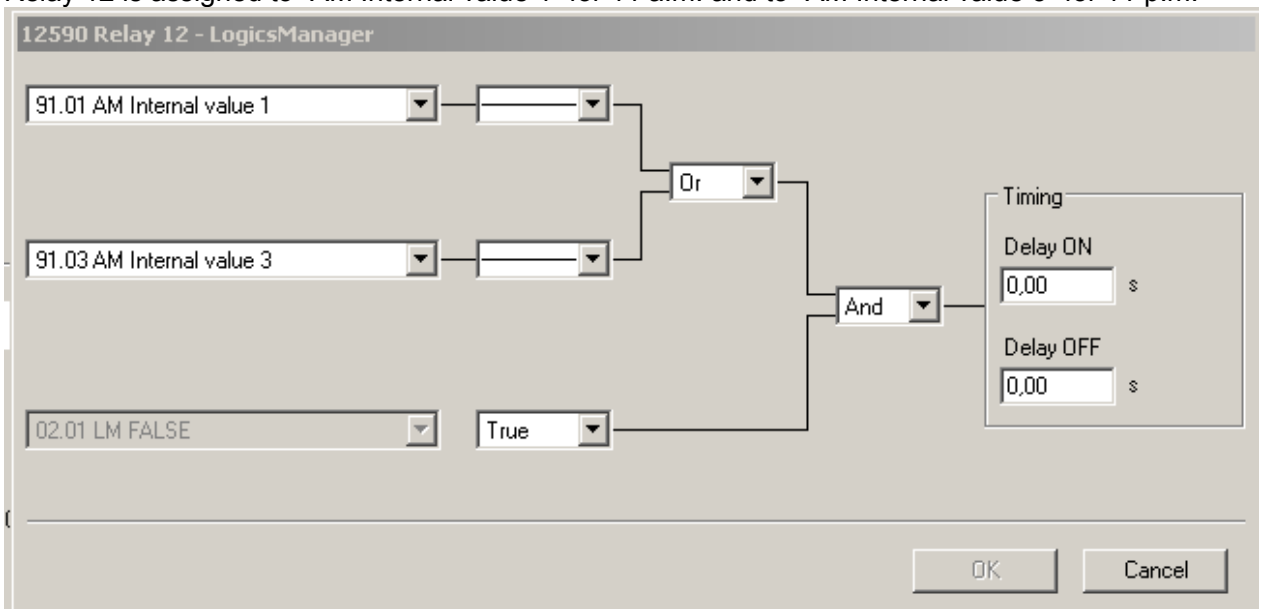


For the 2nd power up a delay time must defined. In the example the time should be 12 h (=43200000 ms).
The power up at 11 a.m. is done like example 1.
For power up at 11 p.m.an “One Shot” of 12 h (C1 = 43200000 ms) is triggered with ”AM Internal value 2”.

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.



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



3.3 Power up every full hour

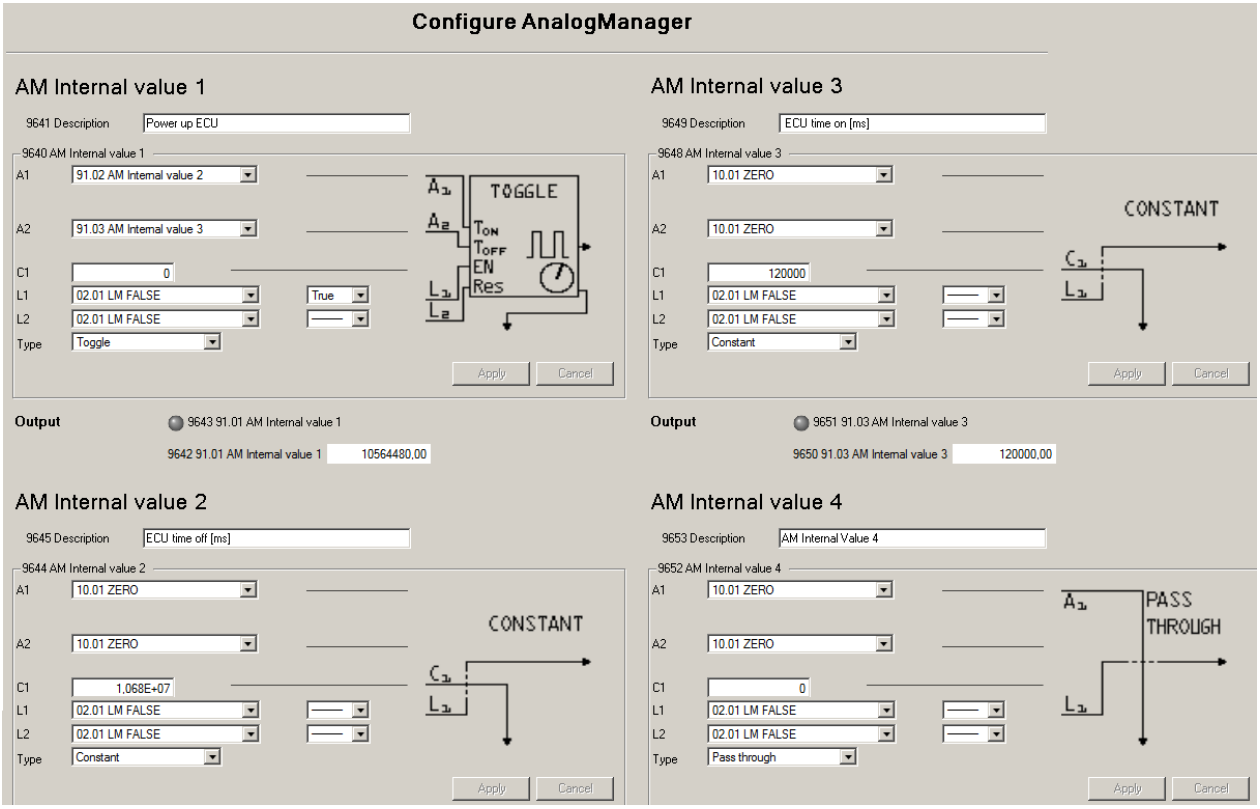
Take the same configuration like example 1 with the following exceptions:
-set the minute you want to power up the ECU parameter 1661 (set 0 for full hour)
-Set L1 of AM Internal value 1 to “11.06 Active minute”

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

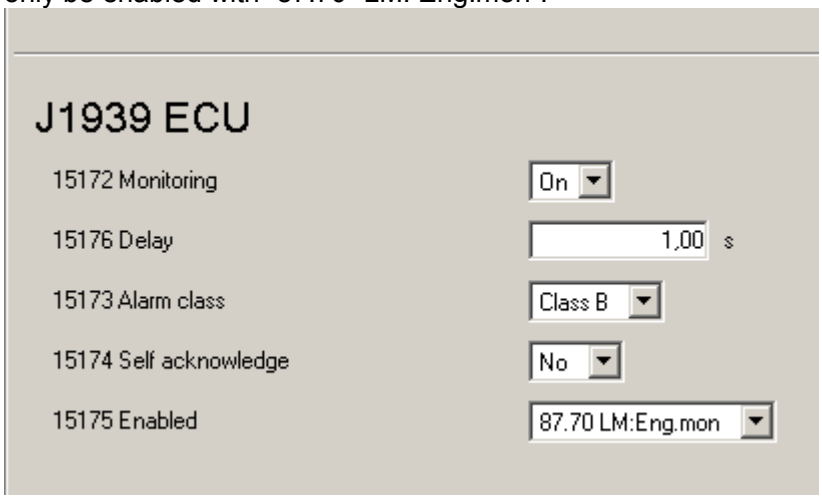
3.5 Power up free defined cycle

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.



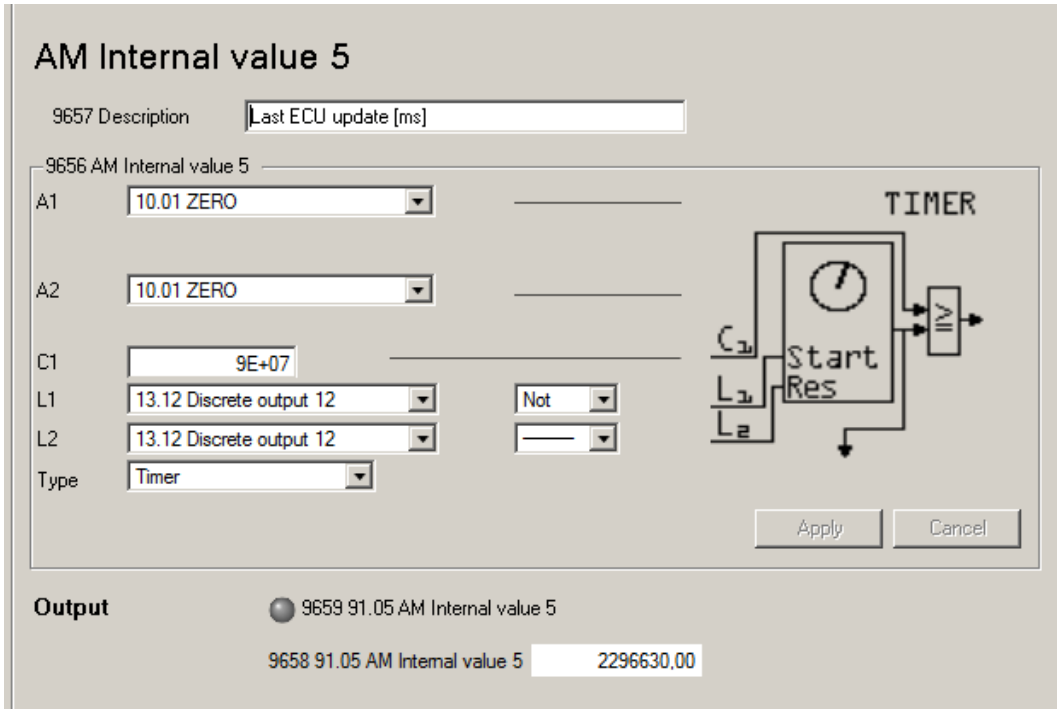
4 J1939 ECU interface monitoring

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”:

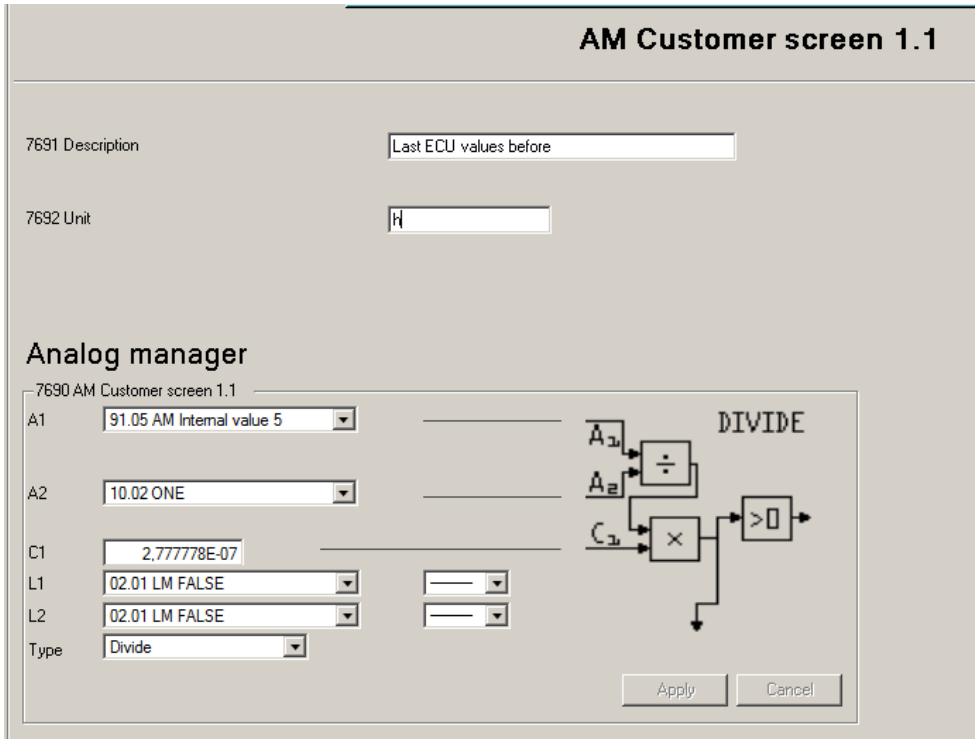


5 Indication of the time since last power up

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 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.)



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