

Autonomous Data Acquisition System for Testing Vehicles

A degree's Final Project Submitted to the Faculty of the
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ANNEX

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Introduction to the studies

In order to expose both economical and environmental studies a standard project is defined. This standard project consist on sending the vehicle instrumented as stated on the documentation from the report to a testing track in Germany. The target from the project is completing 480 hours of uninterrupted data acquisition (20 days).

Annex I: Economical Study

ADAQ is a pioneer system. On the company's department, where the author has developed his work, there is no previous defined system to ADAQ in order to compare it to. Long duration tests were not possible to be hosted. This is not an improvement but a new system; so the company's department can deal with this type of projects and work.

For these reasons, the economical study is focused on comparing the same system of ADAQ run on its autonomous or manual way. So ADAQ vs DAQ.

ADAQ is not only a matter of money but a great system to save time to the technician or analyst. In order to do this study the common infrastructures for both systems have not been taken into account, only those that differentiate ADAQ and DAQ methods. The only different infrastructure is ADAQ needs to incorporate the GPS Antenna and the CDB, while DAQ is activated manually by the pilot at acquisitions start and stop.

The manual execution from ADAQ, DAQ, uses the same acquisition computers and software analysis. However, it implies the driver needs to be instructed about when to press a button in order to start/stop data acquisition. It also implies the manual data transference and the manual execution from the different analysis. For this reason, DAQ means the technician needs to presidientially assisting the test during the whole duration of the same.

In order to make this study the factors that have been considered are: airplane tickets to go and return to Germany (from Barcelona), the hours the technician works on the project and the meals and the lodging the company pays the technician who travels abroad.

ADAQ VS DAQ: PROJECT OF 480H ACQUIRED IN A GERMAN TRACK

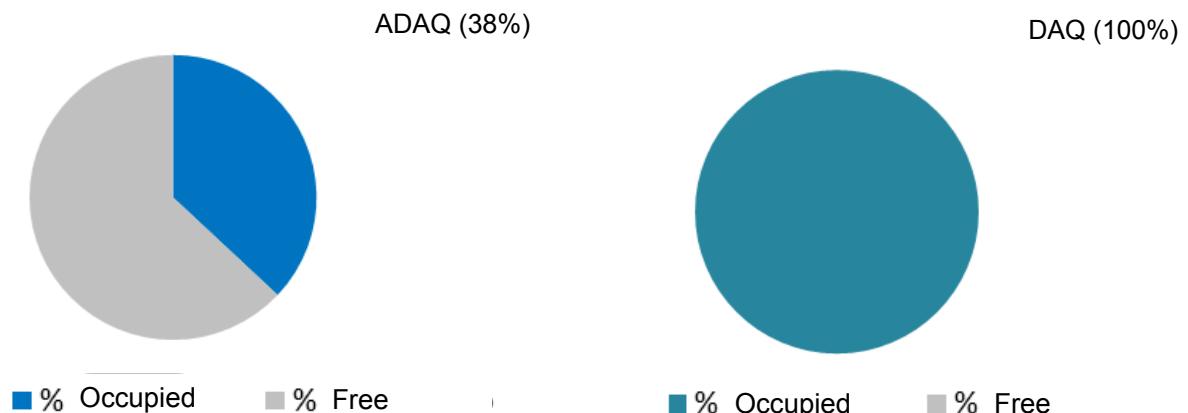
ADAQ:

- 24 hours a day acquiring, during 20 days.
- 7 hours of autonomous analysis at night.
- 3 hours to draw conclusions from the analysis.
- Occupancy rate of the technician: 37,5% (Occupancy rate= 3 worked hours / 8 workday hours)
- Similar project the technician can also manage: +1,67 more projects. (1 project= 3h per day)

DAQ:

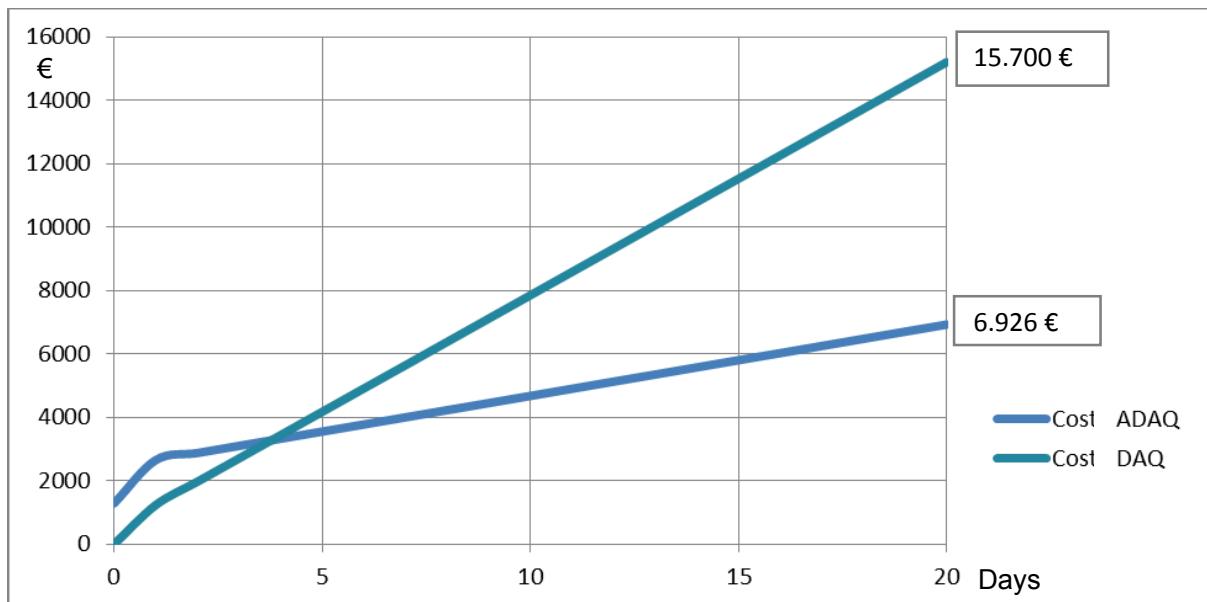
- 24 hours a day acquiring, during 20 days.
- 5 hours of attended analysis by the technician¹.
- 3 hours to draw conclusions from the analysis.
- Occupancy rate of the technician: 100% (Occupancy rate= 5+3 worked hours / 8 workday hours)
- Similar project the technician can also manage: +0,00 more projects. (1 project= 3h per day)

Technician Occupancy Rate ADAQ vs DAQ:



¹ It is considered the synergy with other work activities.

Economical viability ADAQ vs DAQ:



The graphic represents the cost of ADAQ and DAQ systems referred to a project of the same length, 20 days and with the same target.

An initial inversion must be done to implement ADAQ system, this is the GPS antenna and the Control Device Box (CDB).

On both executions the technician needs to go to the acquisition area in order to verify and start the project. After this, on ADAQ system the technician takes a flight back to the headquarters on the second day, while in DAQ the technician has to be on the testing track in order to transfer data and execute the daily analysis during the whole length of the project. This represent a daily cost to the company (basically from meals and lodging) that at the end of the project represents a cost of 15.700€, about 9.000€ more expensive than ADAQ. This difference would be bigger for projects of more days.

Finally, ADAQ is profitable for projects of no less than 4 days of length. For a 20 days project is 2,77 times more profitable than DAQ. It also releases the technician the 62% of its working hours comparing with DAQ. This means the technician could manage almost 2 more projects at the same time, that may take place on any testing track of the World.

Annex II: Environmental Study

On this study is not taken in to account the consumed resources by the computers, by the transportation of the vehicle and the technician to Germany or the possible substitution from transducers or any piece from the vehicle that could be broken/deteriorated during the test. This study is focussed on the average emissions by fuel consumption of the vehicle.

According to the used vehicle's data sheet it consumes 3,3L/100Km of diesel oil. Assuming the average speed of the vehicle during the test is of 60 Km/h, this means the vehicle will consume 288L during the 20 days of uninterrupted data acquisition. Also from its data sheet, the vehicle has an emission of 87g/Km. So after the acquisition, the 288L of diesel oil will produce 2.500Kg of gases to the atmosphere. This means it produces 8,7Kg per liter of diesel consumed.

According to diesel engines emissions, from the 87g of gases per Km, 58,3g are of nitrogen, 8,7g of oxygen, 10,44g of carbon dioxide 9,57g from water vapor and 2,61g of pollutant emissions.

Only 0,3% from the emissions, the equivalent to pollutant emissions are harmful to health and to the environment. This emissions are compound of carbon monoxide, hydrocarbons and nitric oxides.

Finally, 75Kg of pollutant emissions will be emitted to the atmosphere on every project.

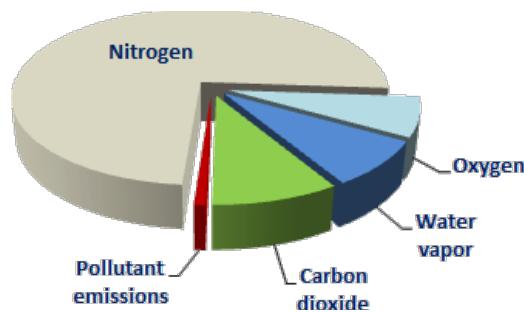


Fig. 1 Diesel oil engines emission.

Annex III: Codes

C1 Star_ADAQ.bat

```
@echo off

color A0
echo YOU HAVE 7 MINUTES TO EITHER
echo 1. LEAVE THE BOX
echo 2. TURN OFF THE VEHICLE BATERY
timeout -t 420
start Conexion_CX22.bat

exit
```

C2 Vanet.bat

```
@echo off

color C0
setlocal
setlocal enabledelayedexpansion

:main
set hour=%time:~0,2%
set min=%time:~3,2%
set reloj=%hour%%min%
if %reloj% GEQ 2320 (
    if %reloj% LEQ 2325 (
        start PCBox_a_ServidorX.bat
        exit :main
    )
) else (
    goto :loop
)

:loop
timeout -t 65
for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
    for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
        for /f "tokens=1-4 delims=." %%c in ("%%b") do (
            set _o1=%%c
            set _o2=%%d
            set _o3=%%e
            set _o4=%%f
        set _3octet!=!_o1:~1!.!_o2!.!_o3!.!_o4!
        )
    )
)
echo CX22W IPv4 169.254.xxx.xxx
echo IPv4 founded !_3octet!
if NOT !_3octet!==169.254.xxx.xxx (
    echo VEHICLE STILL ON TRACK
    goto :looptwo
) else (
    echo VEHICLE IN THE BOX. CX22W CONNECTED CORRECTLY.
    echo COUNTDOWN TO START CX22W REMOTE DESKTOP
    timeout -t 10
    start conectar_red.au3
    exit :loop
)

:looptwo
for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
    for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
        for /f "tokens=1-4 delims=." %%c in ("%%b") do (
            set _o1=%%c
            set _o2=%%d
            set _o3=%%e
            set _o4=%%f
        set _3octet!=!_o1:~1!.!_o2!
        )
    )
)
echo CX22W IPv4 169.254.xxx.xxx
echo IPv4 founded !_3octet!
if NOT !_3octet!==10.xxx (
    goto :loopthree
) else (
    echo CHANGING WLAN
    start adhoc_privatenetwork.au3
    timeout -t 15
    goto :loopthree
)

:loopthree
for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
```

```
for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
for /f "tokens=1-4 delims=." %%c in ("%%b") do (
    set _o1=%%c
    set _o2=%%d
    set _o3=%%e
    set _o4=%%f
set _3octet!=_o1:~1!.!_o2!. !_o3!. !_o4!
)
)
)
echo CX22W IPv4 169.254.xxx.xxx
echo IPv4 founded !_3octet!
if !_3octet!==""
timeout -t 3
goto :loopfour
) else (
echo POSSIBLE AD HOC NET CONFIG ERROR
goto :main
)

:loopfour
netsh wlan show networks | FIND "CX22-W" /I /C
if %errorlevel% equ 0 (
echo WAITING VEHICLE ARRIVAL
goto :main
) else (
echo CHANNGING WLAN
start adhoc_privatenetwork.au3
timeout -t 9
goto :main
)

endlocal
```

C3 Change_wlan.bat

```
@echo off  
taskkill /f /im mstsc.exe  
netsh wlan connect name=[REDACTED]  
timeout -t 12  
start Start_ADAQ_Diurno.bat  
  
exit
```

C4 Remote_Desktop.au3

```
#include <Constants.au3>

BlockInput($BI_DISABLE)
Local $sPid = Run("mstsc.exe", "", @SW_SHOWMAXIMIZED)
Sleep(5000)
Send("{ENTER}")
Sleep(40000)
Send("USER_NAME")
Sleep(2000)
Send("{TAB}")
Sleep(1000)
Send("PASSWORD")
Sleep(1000)
Send("{ENTER}")
Sleep(60000)
MouseClick($MOUSE_CLICK_LEFT, 1350, 10, 1)
Sleep(3000)
MouseClick($MOUSE_CLICK_LEFT, 1255, 750, 1)
Sleep(1000)
MouseClick($MOUSE_CLICK_LEFT, 1255, 490, 1)
Sleep(1000)
Send("{ENTER}")
Sleep(2000)
Local $sPid = Run("Start_ADAQ.bat", "", @SW_SHOWMAXIMIZED)
BlockInput($BI_ENABLE)

Exit
```

C5 CX22toPCBOX.bat

```
@echo off

goto :main
:main
:loop
if EXIST \\tsclient\PCBOX\ADAQComunicacion (
move MC:\ADAQ\PXXXX\*.*      \\tsclient\PCBOX\ADAQComunicacion\Canal_30003
cd CX22W:\ 
echo La ultima vez que se volcaron los datos de la tarjeta del CX22 al PC box fue: >
reporttarjetaapc.txt
echo el dia %Date% a las %time% >> reporttarjetaapc.txt
ping -n 5 127.0.0.1
start CX22W:\tarjetaapcsatelite.bat
exit :loop
) else (
echo Buscando PCBOX para vaciar datos de tarjeta CX22...
goto loop:
)
```

C6 Satellite_CX22toPCBOX.bat

```
@echo off

goto :main
:main
:loop
if EXIST \\tsclient\PCBOX\ADAQComunicacion (
echo Esperando a que el vehiculo inicie su ruta...
goto :loop
) else (
start D:\tarjetaapc.bat
exit :loop
)
```

C7 B2SS.bat

```
@echo off

setlocal
setlocal enabledelayedexpansion
goto :main

:main

:checkloop

for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
    for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
        for /f "tokens=1-4 delims=." %%c in ("%%b") do (
            set _o1=%%c
            set _o2=%%d
            set _o3=%%e
            set _o4=%%f
        set _3octet!=_o1:~1!.!_o2!
            )
        )
    echo IPv4 de VW 10.xxx
    echo IPv4 encontrada !_3octet!
    if !_3octet!=10.xxx (
        goto :loop
    ) else (
        start adhoc_privatenetwork.au3

        ping -n 10 127.0.0.1
        goto checkloop:
    )
:loop

set mydate=%date:~6,4% %date:~3,2% %date:~0,2%
Set /A Result = %mydate% - 20000001

if EXIST PCBOX:\ADAQComunicacion\Canal_YYYYY\*.TIM (
    md SS:\Proyectos_ADAQ\PXXXX\Senales\PXXXX_%result%
    move PCBOX:\ADAQComunicacion\Canal_YYYYY\*.* SS:\Proyectos_ADAQ\TecwarePath
    echo Last time files were moved from the PCBOX to the Shared Server was: >
Report_PCBox_a_ServidorX.txt
    echo the day %Date% at %time% >> Report_PCBox_a_ServidorX.txt
    exit :loop
    start Conexion_CX22.bat
) else (
    echo Buscando datos del vehiculo YYYYY para volcarlos en el Servidor comun...
    goto loop:
)
```

C8 Separator.bat

```
@echo off

goto :main

:main

:loop

SET groupsize=10
SET n=1
SET nf=16
set source="SS:\Proyectos_ADAQ\TecwarePath"
set mydate=%date:~6,4%%date:~3,2%%date:~0,2%
Set /A Result = %mydate% - 20000001

if EXIST SS:\Proyectos_ADAQ\PXXXX\Senales\PXXXX_%result% (

SETLOCAL ENABLEDELAYEDEXPANSION
cd SS:\Proyectos_ADAQ\TecwarePath
FOR /F "delims=" %%I IN ('DIR %source%\*.TIM /A:-D /O:-D /B') DO (
IF !n!=1 (
SET /A nf-=1
MD !nf!
)
MOVE /Y "%%I" !nf!
IF !n!==!groupsize! (
SET n=1

) ELSE (
SET /A n+=1
)
)
ping -n 5 127.0.0.1
start
SS:\Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtecnico\Concatenado_Senales\contador.bat

ENDLOCAL

exit :loop

)else (
echo Buscando Senales del dia %result%...
goto loop:
)
```

C9 Counter.bat

```
@echo off

cd SS:\Proyectos_ADAQ\TecwarePath
set source=SS:\Proyectos_ADAQ\TecwarePath"
for /f %%a in ('DIR %source% /b /ad %folder%^|find /c /v " "') do set count=%%a
cd SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales

if "%count%"=="1" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\1.bat
)

if "%count%"=="2" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\2.bat
)

if "%count%"=="3" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\3.bat
)

if "%count%"=="4" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\4.bat
)

if "%count%"=="5" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\5.bat
)

if "%count%"=="6" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\6.bat
)

if "%count%"=="7" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\7.bat
)

if "%count%"=="8" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\8.bat
)

if "%count%"=="9" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\9.bat
)

if "%count%"=="10" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\10.bat
)

if "%count%"=="11" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\11.bat
)

if "%count%"=="12" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\12.bat
)

if "%count%"=="13" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\13.bat
)

if "%count%"=="14" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\14.bat
)

if "%count%"=="15" (
start SS:Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\Concatenado_Senales\15.bat
)

exit
```

C10 Append_TS_X.bat

```
@echo off
"SS:\tcltk\bin\tclsh.exe" "C:\Program Files (x86)\LMS\Tecware\tecware.tcl"
batch_starter_nogui "SS:\Proyectos_ADAQ\P2016\Ejecutables\Ejecutar_en_PCtecnico\empty.fmi"
"SS:\LMS\Tecware\data\processbuilder\AppendTImeSignalsX.tbd" ()
"SS:\Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtecnico\analisis.bat"
exit
```

C11 Analysis.bat

```
echo off
"C:\Program Files (x86)\LMS\Tecware 3.11\tcltk\bin\tclsh.exe" "C:\Program Files (x86)\LMS Tecware 3.11\tecware.tcl"
batch_starter_nogui "SS:\ADAQ\Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\empty.fmi"
"C:\Program Files (x86)\LMS Tecware 3.11\data\processbuilder\Analisis_4.tbd" ()
"C:\Program Files (x86)\LMS\Tecware 3.11\tcltk\bin\tclsh.exe"
"C:\Program Files (x86)\LMS Tecware 3.11\tecware.tcl" batch_starter_nogui
"SS:\ADAQ\Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\empty.fmi"
"C:\Program Files (x86)\LMS Tecware 3.11\data\processbuilder\Analisis_2.tbd" ()
"SS:\ADAQ\Proyectos_ADAQ\PXXXX\Ejecutables\Ejecutar_en_PCtechnico\postanalisis.bat"

exit
```

C12 Post_analysis.bat

```
@echo off
goto :main
:main
:loop
set mydate=%date:~6,4% %date:~3,2% %date:~0,2%
Set /A Result = %mydate% - 20000001
if EXIST SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.erg (
taskkill /F /IM excel.exe
timeout -t 8
md SS:\ADAQ\Proyectos_ADAQ\P1993\Senales\PXXXX_%result%
md SS:\ADAQ\Proyectos_ADAQ\P1993\Reports\Report_dia\Report_%result%
cd SS:\ADAQ\Proyectos_ADAQ\TecwarePath
timeout -t 8
move SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.xls SS:\ADAQ\Proyectos_ADAQ\PXXXX\Reports\Report_dia\Report_%result%
move SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.doc SS:\ADAQ\Proyectos_ADAQ\PXXXX\Reports\Report_dia\Report_%result%
move SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.txt SS:\ADAQ\Proyectos_ADAQ\PXXXX\Reports\Report_dia\Report_%result%
move SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.erg SS:\ADAQ\Proyectos_ADAQ\PXXXX\Senales\PXXXX_%result%
move SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.hrg SS:\ADAQ\Proyectos_ADAQ\P1993\Senales\PXXXX_%result%
timeout -t 8
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\1
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\2
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\3
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\4
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\5
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\6
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\7
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\8
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\9
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\10
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\11
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\12
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\13
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\14
rd /s /q SS:\ADAQ\Proyectos_ADAQ\TecwarePath\15
```

```

del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.erg.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.gif
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.TIM.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.lms
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.ub
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.TIM
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.dat.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.r32
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.erfm.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.asc
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.xls.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.lms.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.mri
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.i16
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.epsd
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.erfm
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.kml

del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.dat
del SS:\ADAQ\Proyectos_ADAQ\TecwarePath\*.xml
exit :loop

)else (
echo Senales del dia %result% no existen
goto loop:
)

```

C13 Multi_Vanet.bat

```
@echo off

color C0
setlocal
setlocal enabledelayedexpansion
:main
set hour=%time:~0,2%
set min=%time:~3,2%
set reloj=%hour%-%min%
if %reloj% GEQ 2300 (
    if %reloj% LEQ 2330 (
        start Separador.bat
        exit :main
    )
) else (
    goto :loop
)
:loop
netsh wlan connect name=1st SSDI
timeout -t 65
for /f "usebackq tokens=*%a in (`ipconfig ^| findstr /i "ipv4"`) do (
    for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
        for /f "tokens=1-4 delims=." %%c in ("%%b") do (
            set _o1=%%c
            set _o2=%%d
            set _o3=%%e
            set _o4=%%f
        set _3octet!=_o1:~1!.!_o2!.!_o3!.!_o4!
        )
    )
)
echo CX22W IPv4 169.254.xxx.xxx
echo IPv4 founded !_3octet!
if NOT !_3octet!=169.254.xxx.xxx (
    echo VEHICLE STILL ON TRACK
    goto :looptwo
) else (
    echo VEHICLE IN THE BOX. CX22W CONNECTED CORRECTLY.
    echo COUNTDOWN TO START CX22W REMOTE DESKTOP
    timeout -t 10
    start conectar_red_diurna_1.au3
    exit :loop
)

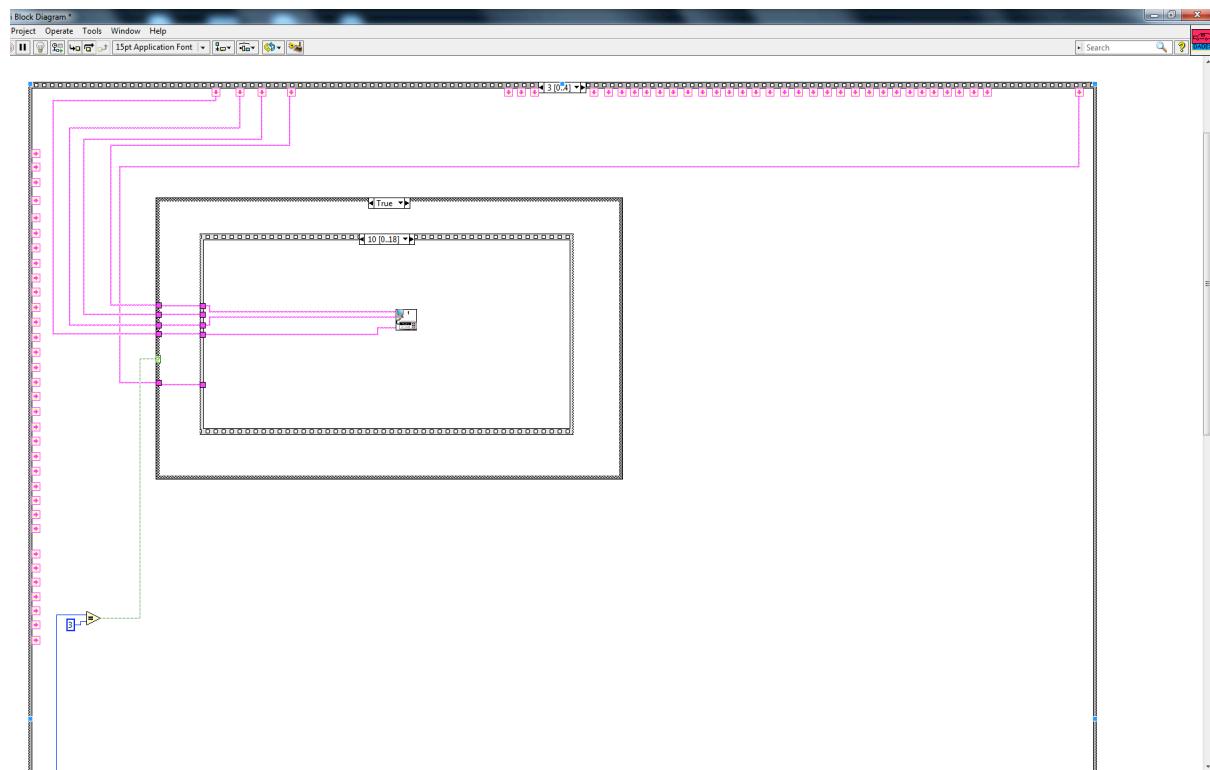
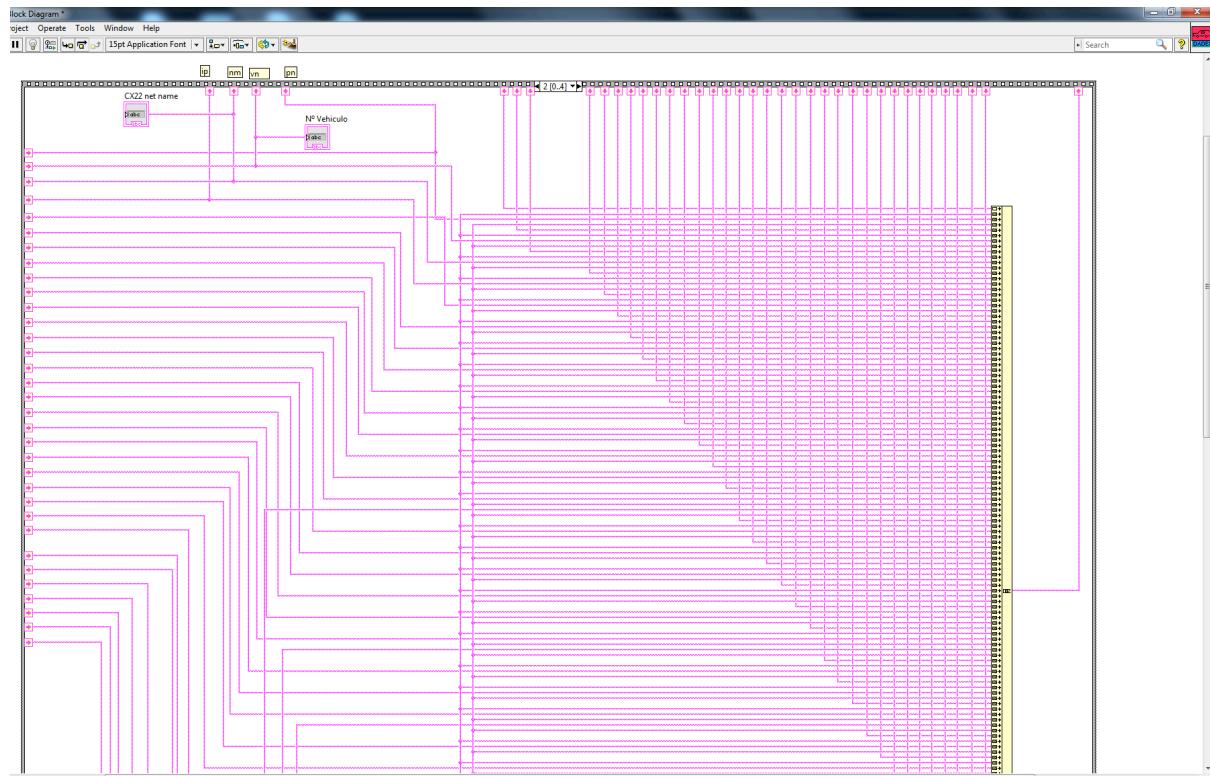
:looptwo
netsh wlan connect name=2nd SSDI
timeout -t 65
for /f "usebackq tokens=*%a in (`ipconfig ^| findstr /i "ipv4"`) do (
    for /f delims^=^:^ tokens^=2 %%b in ('echo %%a') do (
        for /f "tokens=1-4 delims=." %%c in ("%%b") do (
            set _o1=%%c
            set _o2=%%d
            set _o3=%%e
            set _o4=%%f
        set _3octet!=_o1:~1!.!_o2!.!_o3!.!_o4!
        )
    )
)
echo CX22W IPv4 169.254.yyy.yyy
echo IPv4 founded !_3octet!
if NOT !_3octet!=169.254.yyy.yyy (
    echo VEHICLE STILL ON TRACK
    goto :loopthree
) else (
    echo VEHICLE IN THE BOX. CX22W CONNECTED CORRECTLY.
    echo COUNTDOWN TO START CX22W REMOTE DESKTOP
    timeout -t 10
    start conectar_red_diurna_2.au3
    exit :looptwo
```

```

)
:loopthree
netsh wlan connect name=3rd SSDI
timeout -t 65
for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
  for /f delims^=:^ tokens^=2 %%b in ('echo %%a') do (
  for /f "tokens=1-4 delims=." %%c in ("%%b") do (
    set _o1=%%c
    set _o2=%%d
    set _o3=%%e
    set _o4=%%f
set _3octet!=!_o1:~1!.!_o2!.!_o3!.!_o4!
  )
)
)
echo CX22W IPv4 169.254.zzz.zzz
echo IPv4 founded !_3octet!
if NOT !_3octet!=169.254.zzz.zzz (
echo VEHICLE STILL ON TRACK
goto :loopfour
) else (
echo VEHICLE IN THE BOX. CX22W CONNECTED CORRECTLY.
echo COUNTDOWN TO START CX22W REMOTE DESKTOP
timeout -t 10
start conectar_red_diurna_3.au3
exit :loopthree
)
:loopfour
netsh wlan connect name=4th SSDI
timeout -t 65
for /f "usebackq tokens=*" %%a in (`ipconfig ^| findstr /i "ipv4"`) do (
  for /f delims^=:^ tokens^=2 %%b in ('echo %%a') do (
  for /f "tokens=1-4 delims=." %%c in ("%%b") do (
    set _o1=%%c
    set _o2=%%d
    set _o3=%%e
    set _o4=%%f
set _3octet!=!_o1:~1!.!_o2!.!_o3!.!_o4!
  )
)
)
echo CX22W IPv4 169.254.ttt.ttt
echo IPv4 founded !_3octet!
if NOT !_3octet!=169.254.ttt.ttt (
echo VEHICLE STILL ON TRACK
goto :loopfour
) else (
echo VEHICLE IN THE BOX. CX22W CONNECTED CORRECTLY.
echo COUNTDOWN TO START CX22W REMOTE DESKTOP
timeout -t 10
start conectar_red_diurna_3.au3
exit :loopthree
)
endlocal

```

VI1 vehicle_specifications.vi



VI2 vehicle_specifications.vi

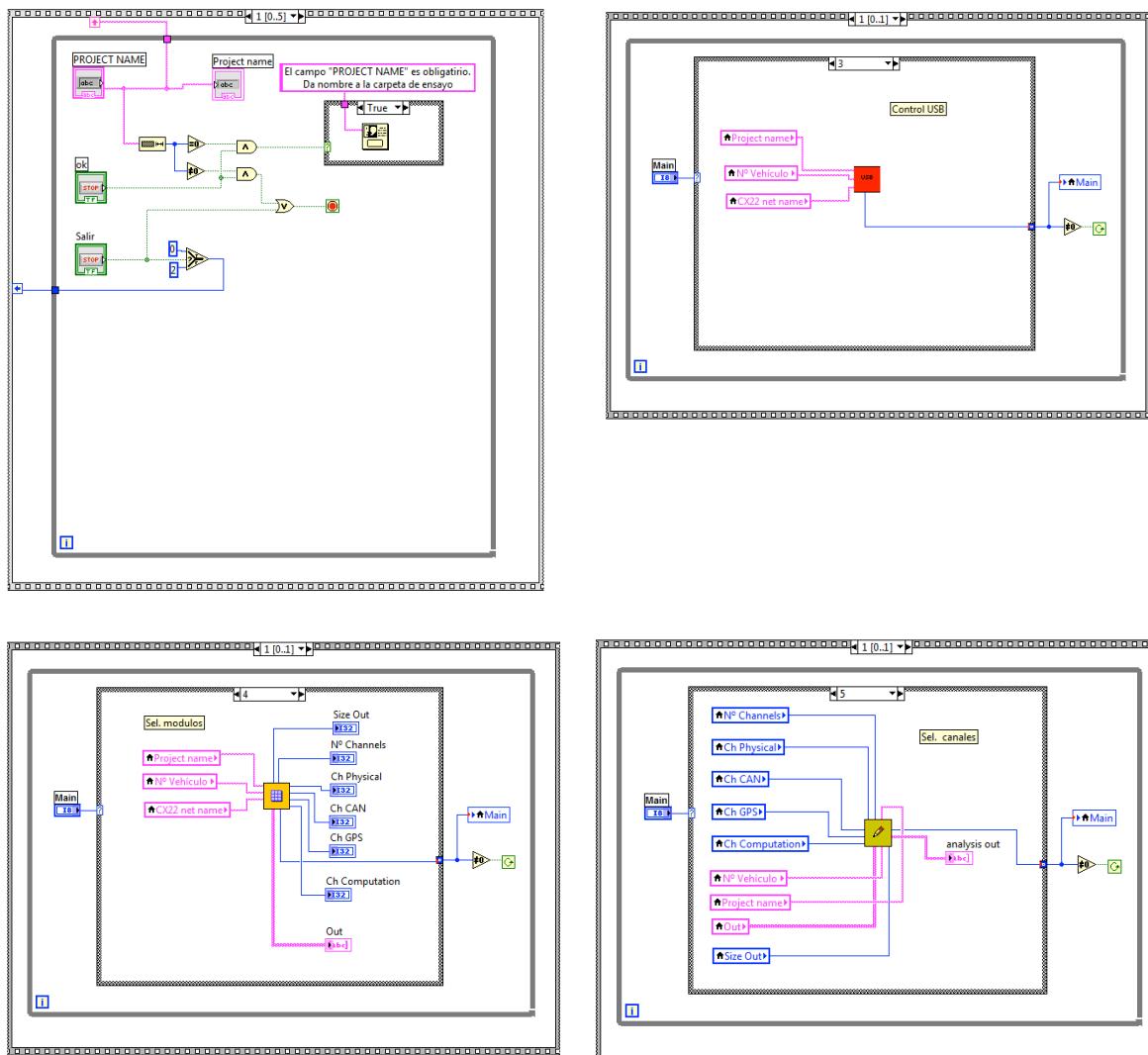


VI3 project_okey.vi

VI4 control_usb.vi

VI5 modules_selector.vi

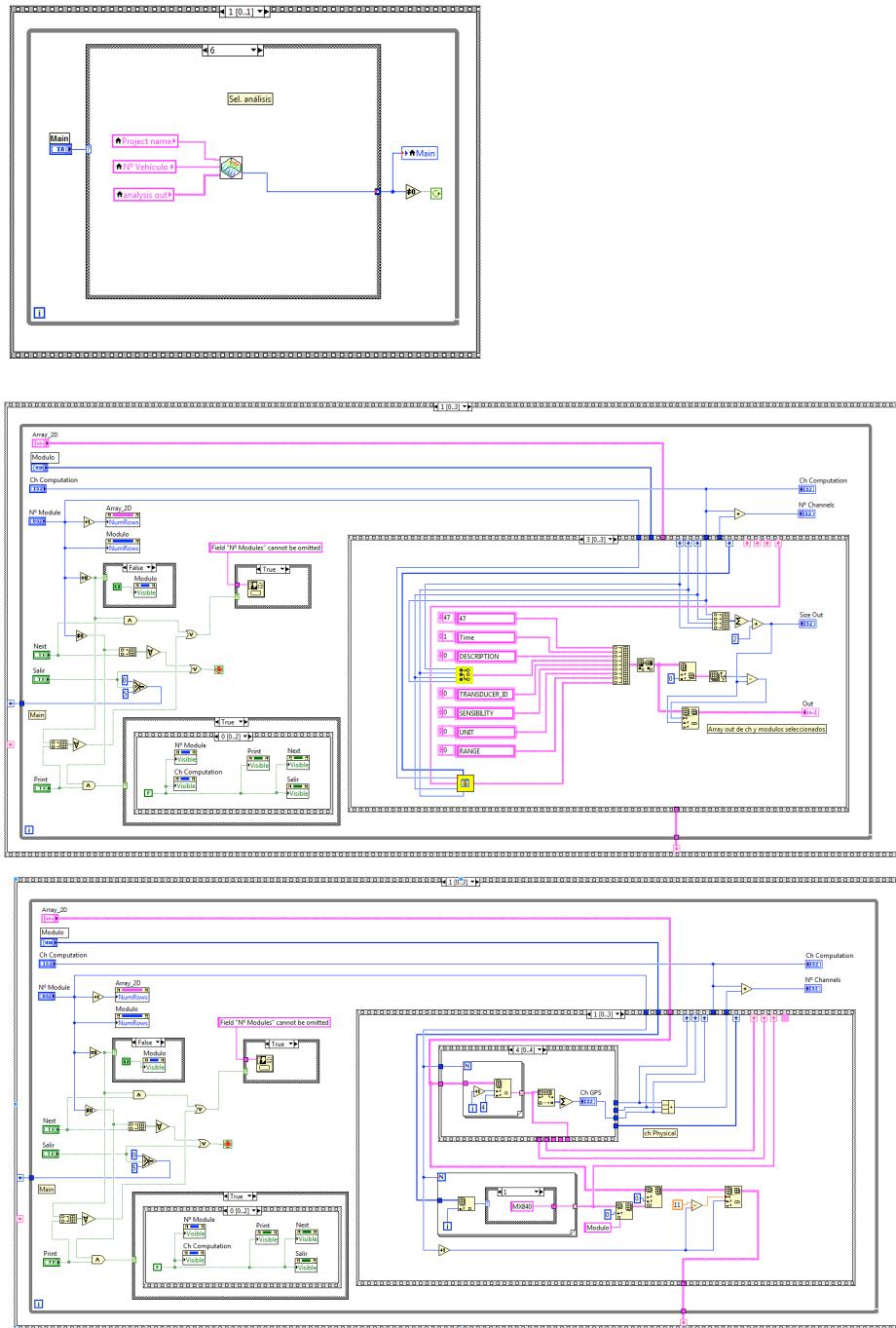
VI6 channels_selector.vi



VI7 analysis.vi

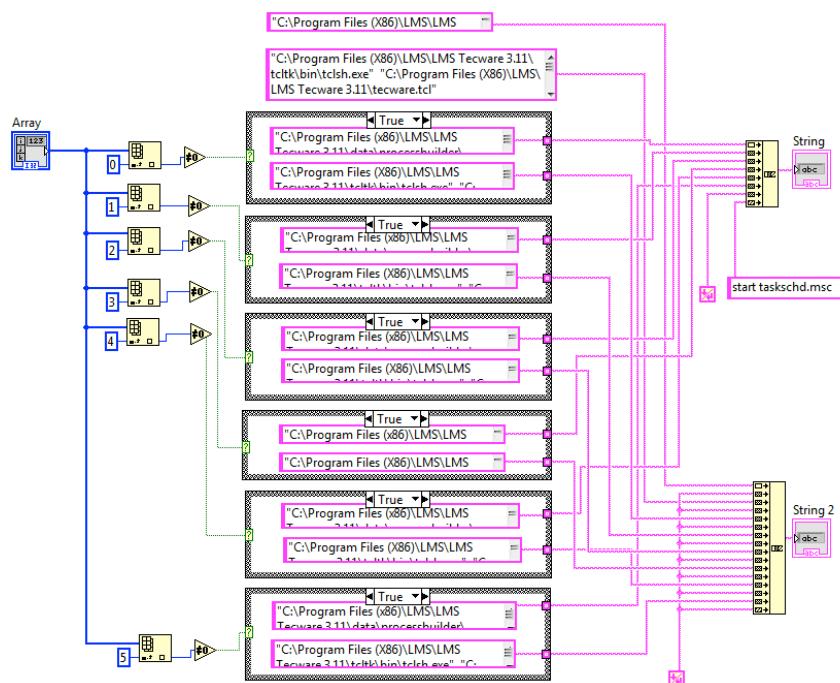
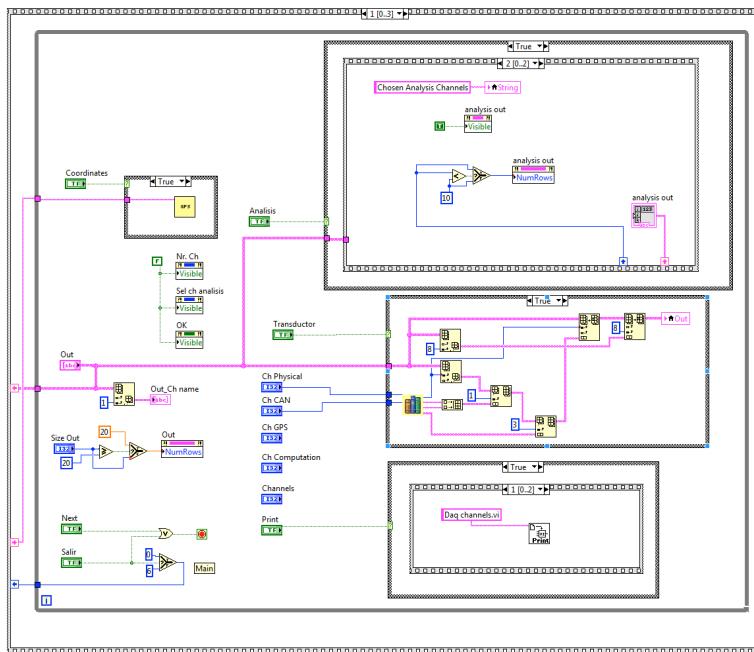
VI8 modules_selector.vi

VI9 modules_selector.vi

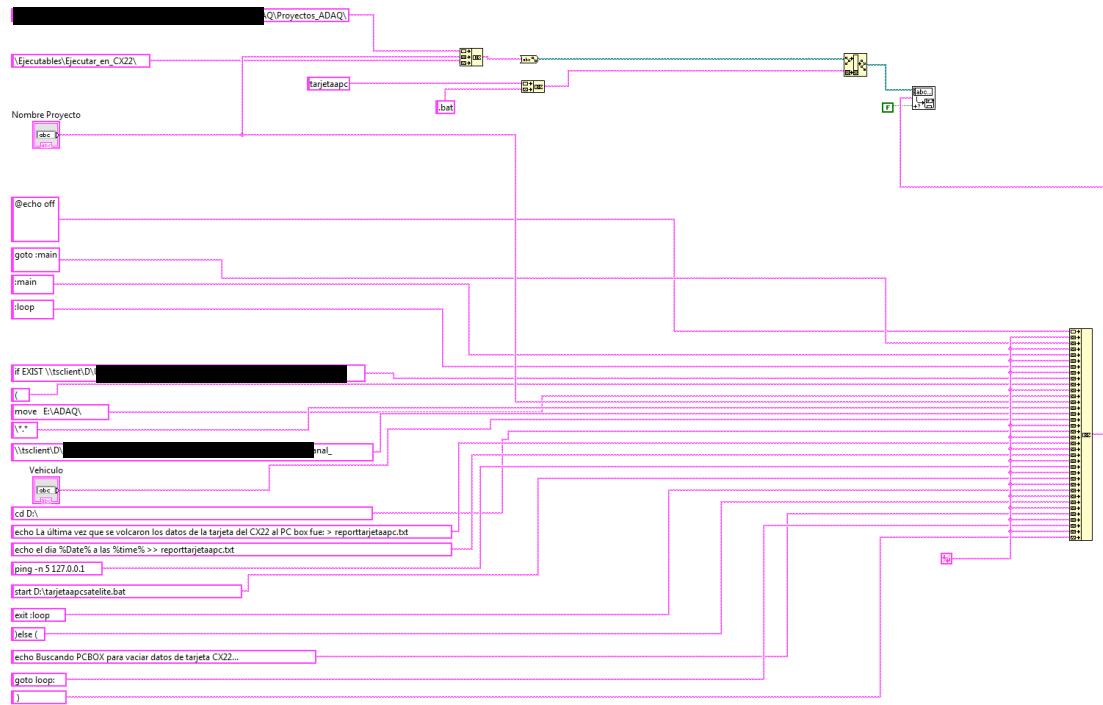


VI10 channels_selector.vi

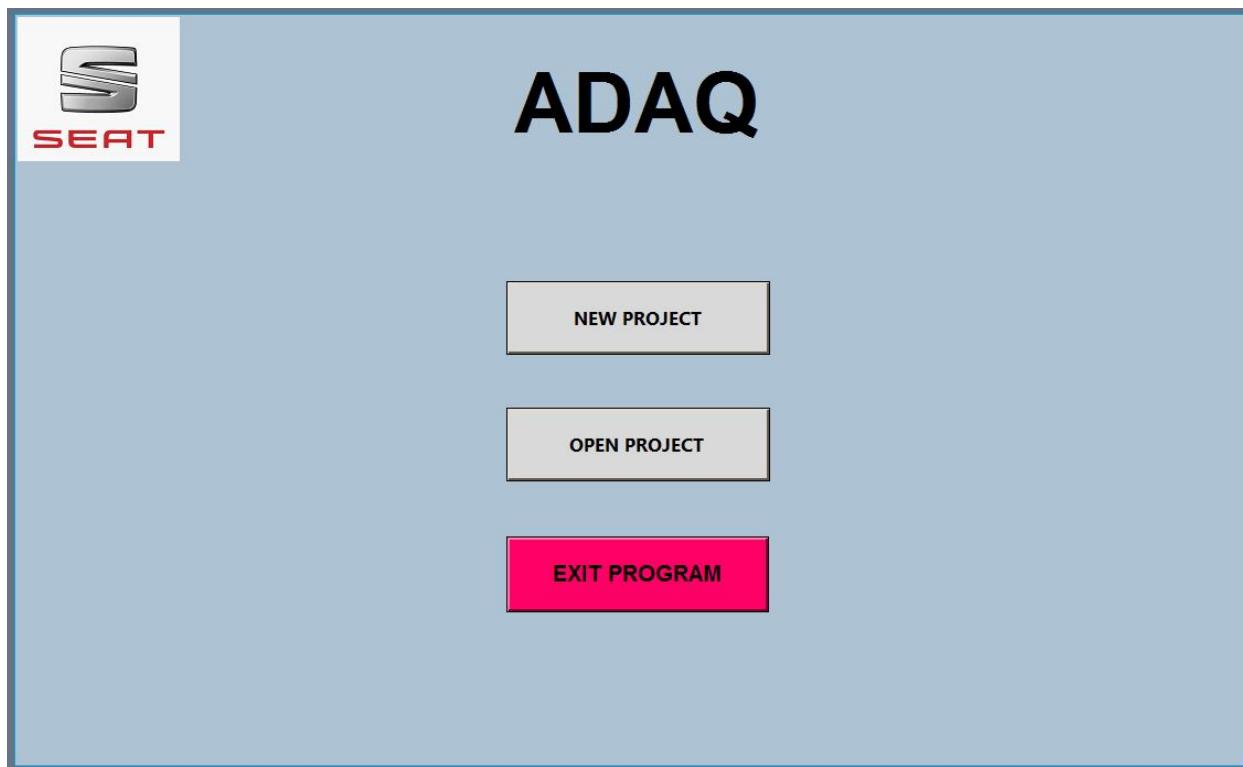
VI11 analysis.vi



VI12 tarjetaapc.vi (every command is created thanks to similar VI to this one)



VI Screen 1



VI Screen 2



VI Screen 3

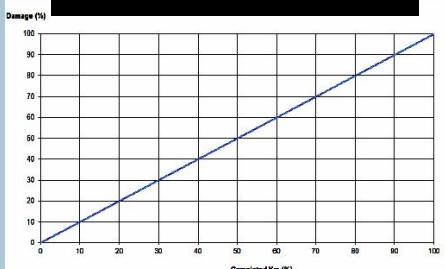
VEHICLE SPECIFICATIONS

	PROJECT NAME P1234			NEXT
	VEHICLE NUMBER 22222			OPEN FILE
	CX22 NET NAME [REDACTED]			CLEAR
	CX22 IPv4 ADDRESS 169.254.1.1			PRINT
Test	Centro Técnico SEAT	Date	29.11.16	EXIT
Test Number	001	Responsable	X	
Vehicle	[REDACTED]	Frame	[REDACTED]	Initial KMs
Engine Type	[REDACTED]	Transmission	[REDACTED]	Layout
Suspension and		Aggregate Lagerung		
Front Suspension	[REDACTED]	Rear Suspension	[REDACTED]	Motorlage
Front Shock Absorber	[REDACTED]	Rear Shock Absorber	[REDACTED]	Getriebelage
Tires	[REDACTED]	Front/Rear Pressure (bars)	[REDACTED]	Pendelstütze
Empty Vehicle Weight		Loads		Tested Vehicle
Front Axle Weight (kg)	[REDACTED]	Front Seats	[REDACTED]	Front Axle Weight (kg)
Rear Axle Weight (kg)	[REDACTED]	Rear Seats	[REDACTED]	Rear Axle Weight (kg)
Total Vehicle Weight (kg)	[REDACTED]	Trunk	[REDACTED]	Total Vehicle Weight (kg)
Notes	Ejemplo			

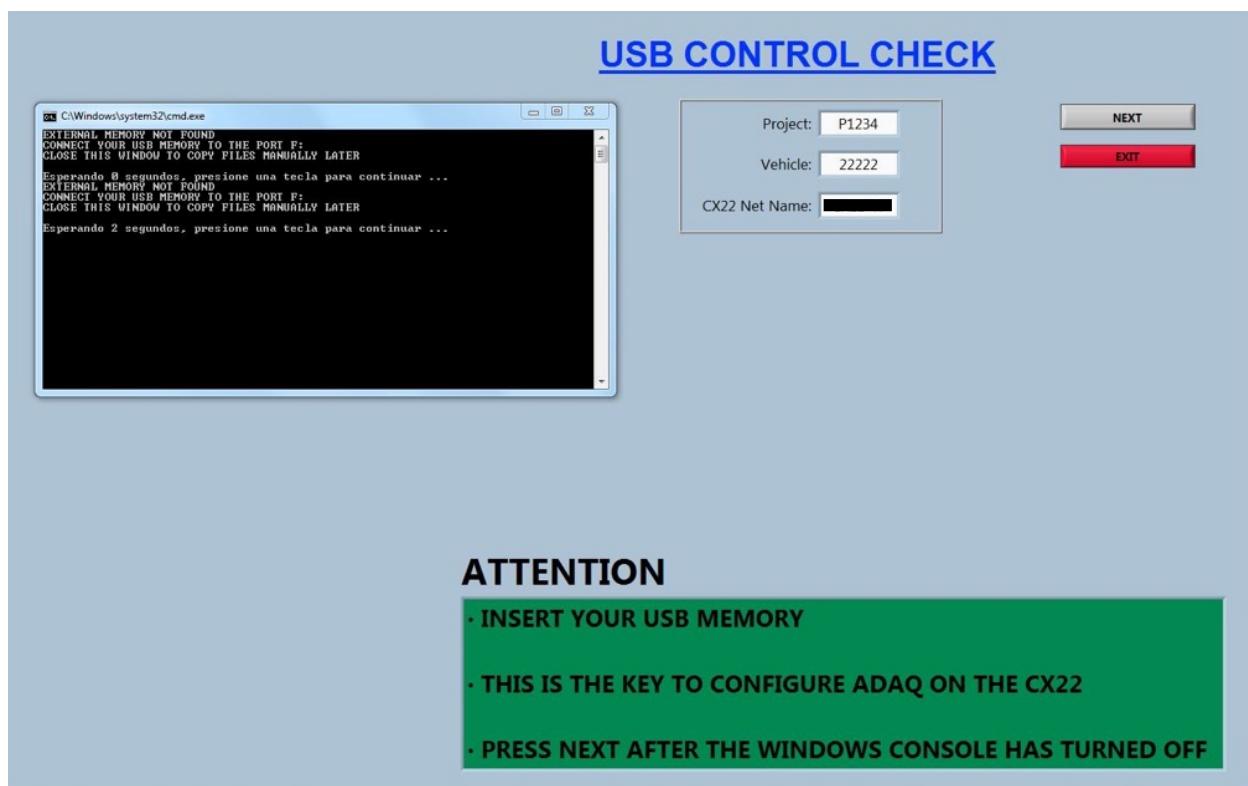
VI Screen 4

TRACK SELECTION

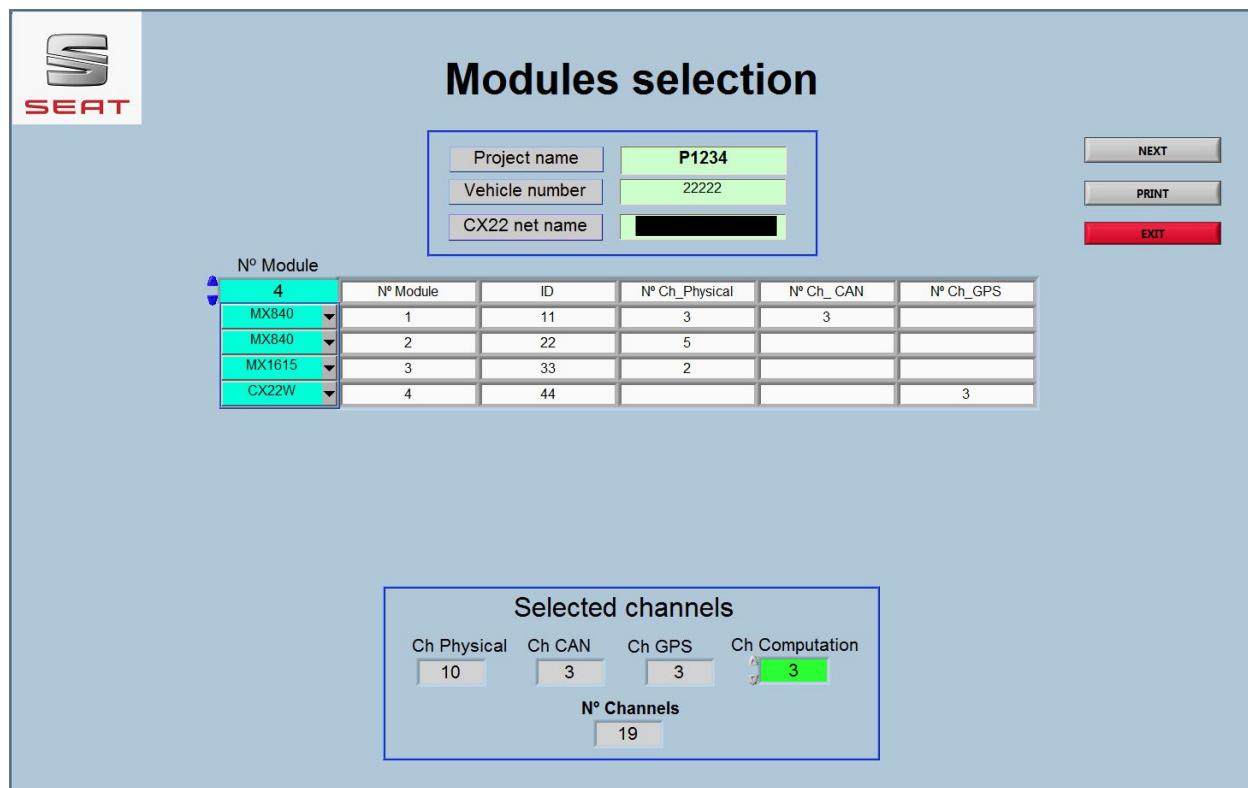
TESTING TRACK SELECTION	OBJECTIVE DAMAGE SELECTION	NEXT
VIEW	OBJECTIVE DAMAGE	EXIT
IMPORT	IMPORT	

VI Screen 5



VI Screen 6



VI Screen 7

Channel Configuration

CH NUMBER	CH_NAME	DESCRIPTION	TRANSDUCER	TRANSDUCER_ID	SENSIBILITY	UNIT	RANGE	CATMAN MODULE ID
1	Time				sg		All module	
2			CAN				1_Mx840_11	
3			CAN				1_Mx840_11	
4			CAN				1_Mx840_11	
5							1_Mx840_11	
6							1_Mx840_11	
7							1_Mx840_11	
8							2_Mx840_22	
9							2_Mx840_22	
10							2_Mx840_22	
11							2_Mx840_22	
12							2_Mx840_22	
13							3_Mx1615_33	
14							3_Mx1615_33	
15			GPS				4_CX22W_44	
16			GPS				4_CX22W_44	
17			GPS				4_CX22W_44	
18		Computation						
19		Computation						

Analysis Ch Selector

Nr. Ch	Sel ch analysis
3	0
	5
	12
	19

Ch Physical
10
Ch GPS
3
Ch CAN
3
Ch Computation
3
Channels
19

VI Screen 8

Analysis

CHANNEL	DAMAGE	Multi DAMAGE	STATISTICS	PSD+	CUSTOM	FREQ. DAMAGE
Channel 1						
Channel 2						
Channel 3						
Channel 4						
Channel 5						
Channel 6						
Channel 7						
Channel 8						
Channel 9						

Project: P1234
Vehicle: 22222

NEXT
EXIT