Title:	**Replace function of NV Subsystem**	
References:		
Distribution:		
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Review:		
Approved:		
Remarks		

Contents

1 Introduction

1.1 Scope

This specification describes the replace function of IIWire Platform. And the mechanism of the Data exchanging between FE and CB.

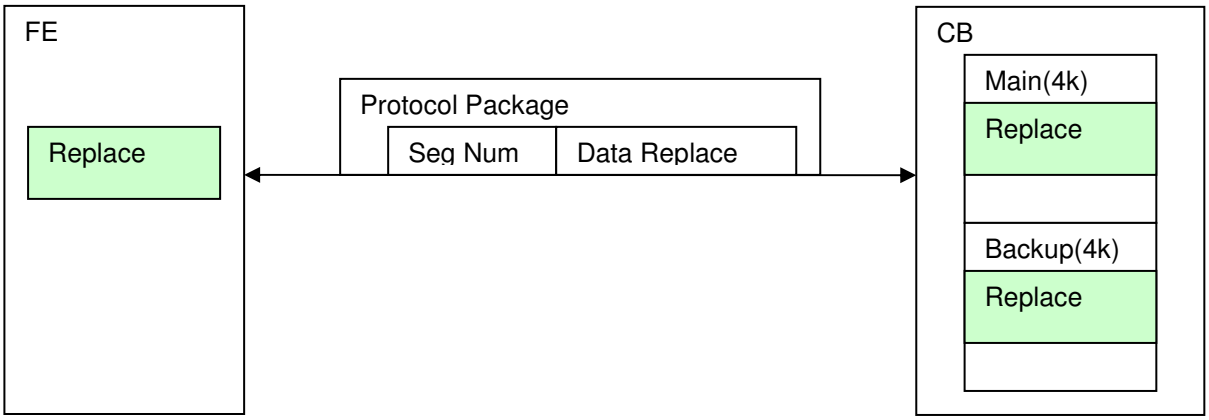
1.2 Reference Documents

1.3 Acronym and definitions

NV	Non-volatile Memory
FE	Highway Addressable Remote Transducer
EEPROM	Electrical Erasable PROM
UART	Universal Asynchronous Receive/Transmitter
CB	Communication Board

2 Detailed Design Description

2.1 Data Mapping



2.2 Dynamic Modelling

2.2.1 CB TO FE

Test Strategy:

We are plan to set the same data in the FEI with the replace required function of Current Out Subsystem, after device execute the replace function, data will put into FEI. And the object in FEI will have the same value as Current Out Subsystem.

Data defined in the FEI:

```
//! structure of Replace block
 typedef struct _T_FRONT_END_INTERFACE_REPLACE
 {
    //@SubGen start@    <DATACLASS Replace>
   TUSIGN8 loopCurrentModeFE;
```

```
    TUSIGN8 alarmSelectionFE;
    TFLOAT floatTestFE[4];
     //@SubGen end@    <DATACLASS Replace>
} T_FRONT_END_INTERFACE_REPLACE;
```

structure of ReplaceArray block to overlap the data. Simulation the segment in NV.

```
typedef struct _T_FRONT_END_INTERFACE_REPLACE_ARRAY
{
     //@SubGen start@    <DATACLASS ReplaceArray>
    TUSIGN8 dataSet[32];
     //@SubGen end@    <DATACLASS ReplaceArray>
} T_FRONT_END_INTERFACE_REPLACE_ARRAY;
```

Replace data in CurrentOut:

```
typedef struct _T_CURRENT_OUT_REPLACE_STATIC_FREQUENT_STATIC_DEFAULT
{
     //@SubGen start@    <DATACLASS ReplaceStaticFrequentStaticDefault>
    TUSIGN8 loopCurrentMode;
    TUSIGN8 alarmSelection;
    TFLOAT alarmLowValue;
    TFLOAT alarmHighValue;
    TFLOAT spanLimitLowValue;
    TFLOAT spanLimitHighValue;
     //@SubGen end@    <DATACLASS ReplaceStaticFrequentStaticDefault>
} T_CURRENT_OUT_REPLACE_STATIC_FREQUENT_STATIC_DEFAULT;
```

Will change data in FEI.

2.2.1.1 Dependency. implement FE's Interface.

The FEI in the IIWire shall be updated as the following code. Another parameter TUSIGN16 is also necessary.

Update FEI NV Replace API.

```
1.
2.  //-----------------------------------------------------------------------------------------------
3.  /*!
4.   \if @SubGen start@ <METHODHEADER PUTNVDATASRV> \endif
5.   \brief
6.   \param  sIdx
7.   \param  pData
8.   \param  length
9.   \if @SubGen end@ <METHODHEADER PUTNVDATASRV> \endif
10.  \author
11.  \date
12.  \param void
13.  \return void
14.  \warning
15.  \test
16.  test-date: 2004-MM-DD
17.  \n by: pp ss
18.  \n environment:
19.  \n intention:
20.  \n result module test:
```

```
21.  \n result Lint Level 3:
22.  \bug
23. */
24. //-----------------------------------------------------------------------------------------------
25. //@SubGen start@<METHOD PUTNVDATASRV>
26. TUSIGN8 PutNvDataSRV_FE(TUSIGN16 sIdx, TUSIGN8* pData, TUSIGN8 length)
27. //@SubGen end@<METHOD PUTNVDATASRV>
28. {
29.
30. }
```

Step two: Set up an test data container:

Step 3. Create Hart command180- hart command 183 to support test.

427	180		Current_Out	loopCurrentMode		0	NONE	NO	REQ+RES
428	180		Current_Out	alarmSelection		1	NONE	NO	REQ+RES
429	182		FrontEndInterface	loopCurrentModeFE		0	NONE	NO	REQ+RES
430	182		FrontEndInterface	alarmSelectionFE		1	NONE	NO	REQ+RES
431	181		Current_Out	loopCurrentMode		0	NONE	NO	REQ+RES
432	181		Current_Out	alarmSelection		1	NONE	NO	REQ+RES
433	183		FrontEndInterface	loopCurrentModeFE		0	NONE	NO	REQ+RES
434	183		FrontEndInterface	alarmSelectionFE		1	NONE	NO	REQ+RES

test case1

Disable Replace function.
Switch off SW1.1.

Description:
Set , the value of alarmSelectionFE will still keep as 0x01. and at the same time set alarmSelection as 0x00,

As alarmSelection is none volatile . and It's value is 0x00 , alarmSelectionFE Is 0X01.so if the replace function is disabled , the value of alarmSelectionFE will still keep as 0x01. or It will be 0x00

a).Set loopCurrentMode and alarmSelection with 0x00,0x00

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B4__________|02||00 00|50
LACKP|FF FF FF FF|86|9A FF 01 00 00|B4__________|04|00 50|00 00|02.
```

b).Set loopCurrentModeFE and alarmSelectionFE with 0x01,0x01

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B6__________|02||01 01|52
LACKP|FF FF FF FF|86|9A FF 01 00 00|B6__________|04|00 50|01 01|00
```

Do reset.

c).read loopCurrentMode and alarmSelection from device. Both is 0x00.

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B5__________|02||00 00|51
LACKP|FF FF FF FF FF|86|9A FF 01 00 00|B5__________|04|00 50|00 00|03
```

d).read loopCurrentModeFE and alarmSelectionFE from device. Both is 0x01

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B7__________|02||00 00|53
LACKP|FF FF FF FF FF|86|9A FF 01 00 00|B7__________|04|00 50|01 01|01
```

Compare the data we set and read. Then we can draw a conclusion. The replace function is disabled.

Test case 2

Swith SW1.1 AND SW.2 On to execute the replace function “CB to FE”.

Description:

I If alarmSelection 0x00 , alarmSelectionFE Is 0X01.so if the replace function is execute correctly ,then the value of alarmSelectionFE will be 0x00. or It will still be 0x01

Notice: 122,20,54,48,48,48,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 to enable access.

a) Read Cur’s data via hart command.

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B5__________|02||00 00|51
LACKP|FF FF FF FF|86|9A FF 01 00 00|B5__________|04|00 70|00 00|23
```

b)Read FEI’s data via hart command.

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B7__________|02||00 00|53
LACKP|FF FF FF FF FF|86|9A FF 01 00 00|B7__________|04|00 50|01 01|01
```

Swith SW1.1 AND SW.2 On and Reset.

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B5__________|02||00 00|51
LACKP|FF FF FF FF FF|86|9A FF 01 00 00|B5__________|04|00 50|00 00|03
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B7__________|02||00 00|53
LACKP|FF FF FF FF FF|86|9A FF 01 00 00|B7__________|04|00 50|00 00|01
```

Compare the data we set and read. Then we can draw a conclusion. The replace function CB TO FE is OK.

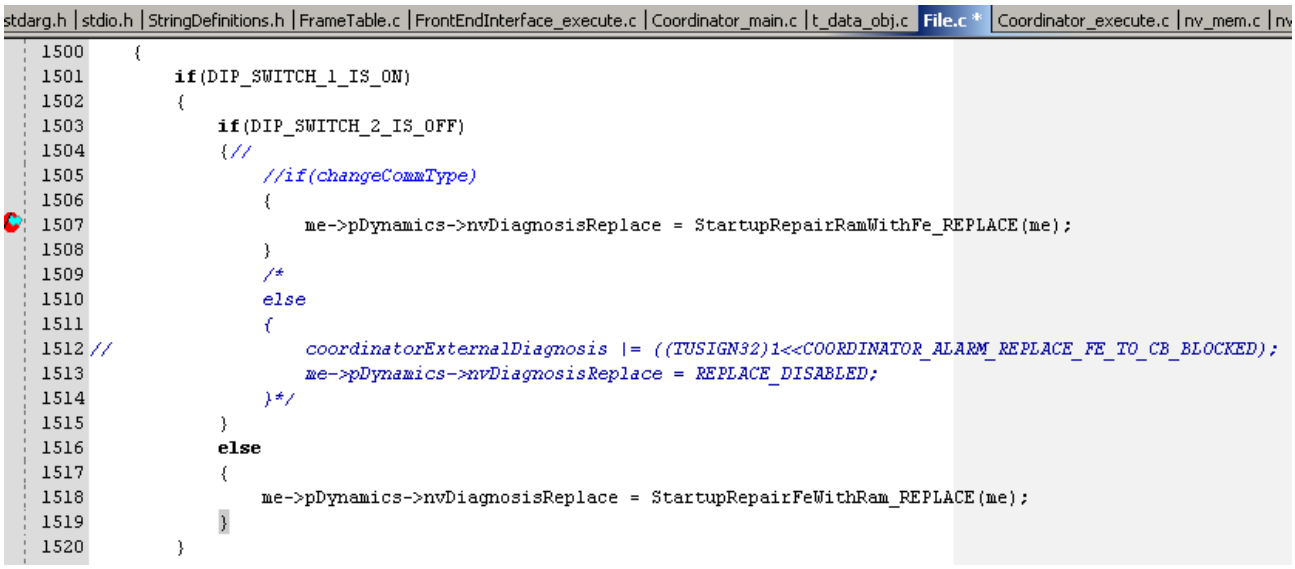
2.2.2 FE TO CB

When the segment we put into non common area. Then then replace will perform .

```
                    if(changeCommType)
                    {
                        me->pDynamics->nvDiagnosisReplace =
StartupRepairRamWithFe_REPLACE(me);
                    }

                    else
                    {
//                      coordinatorExternalDiagnosis |=
((TUSIGN32)1<<COORDINATOR_ALARM_REPLACE_FE_TO_CB_BLOCKED);
                        me->pDynamics->nvDiagnosisReplace = REPLACE_DISABLED;
                    }
```

so I change code. Whether the file is common or uncommon. We will execute replace.



```
1500    {
1501        if(DIP_SWITCH_1_IS_ON)
1502        {
1503            if(DIP_SWITCH_2_IS_OFF)
1504            {//
1505                //if(changeCommType)
1506                {
1507                    me->pDynamics->nvDiagnosisReplace = StartupRepairRamWithFe_REPLACE(me);
1508                }
1509                /*
1510                else
1511                {
1512//                  coordinatorExternalDiagnosis |= ((TUSIGN32)1<<COORDINATOR_ALARM_REPLACE_FE_TO_CB_BLOCKED);
1513                    me->pDynamics->nvDiagnosisReplace = REPLACE_DISABLED;
1514                }*/
1515            }
1516            else
1517            {
1518                me->pDynamics->nvDiagnosisReplace = StartupRepairFeWithRam_REPLACE(me);
1519            }
1520        }
```

//then the data in FE uncommon segment is replace to current out subsystem, Actually the data is in FEI.

If fail . The data read by hart should like this.

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B5__________|02||00 00|51
LACKP|FF FF FF FF|86|9A FF 01 00 00|B5__________|04|00 70|00 00|23
```

Actually , now. current out subsystem have the same value as FEI. (which simulate the FE data. But do not take communication into consideration.)

```
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B5__________|02||00 00|51
LACKP|FF FF FF FF|86|9A FF 01 00 00|B5__________|04|00 70|01 01|23
LSTXP|FF FF FF FF FF|82|9A FF 01 00 00|B7__________|02||00 00|53
LACKP|FF FF FF FF|86|9A FF 01 00 00|B7__________|04|00 50|01 01|01
```