```
./Avalon/altera_avalon_pio_regs.h
altera avalon pio regs.h
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FpgaSvstem.h
// In NIOS version of code, these values were all defined in the System.h file
output by Quartus Tool
// Now come out in some html files, in handoff directory
// defines from System.h in NIOS2 version, don't know where they go in CycloneV
version
// PA drivers
./Avalon/io.h
io.h
     printf("writel: addr 0x%x val:0x%x\n", base + (reg<<2), val);</pre>
//
./HardwareLibrary/alt_16550_uart.c
alt_16550_uart.c
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alt bridge manager.c
alt_bridge_manager.c - API for the Altera SoC FPGA bridge manager.
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/*! \file
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/*! \file
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  Application Programming Interface

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alt\_mmu.h

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alt mpu registers.h

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alt nand private.h

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```
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/*! \file
  * Altera - SoC Reset Manager
```

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alt spi.h
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alt system manager.h
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alt_timers.h
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  *************************************
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alt acpidmap.h

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alt clkmgr.h

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alt_dap.h

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*************************************
./CycloneMCU_App/src/driverlib/adc.c
//
// FILE: adc.c
//
// TITLE: C28x ADC driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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//
// FILE: adc.h
//
// TITLE: C28x ADC driver.
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// $
./CycloneMCU App/src/driverlib/asysctl.c
asysctl.c
//
// FILE: asysctl.c
//
// TITLE: C28x Driver for Analog System Control.
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asysctl.h
//
// FILE: asysctl.h
//
// TITLE: C28x driver for Analog System Control.
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can.c
//
// FILE: can.c
//
// TITLE: C28x CAN driver.
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can.h
//
// FILE: can.h
// TITLE: C28x CAN driver.
//
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cla.c
//
// FILE: cla.c
//
// TITLE: CLA Driver Implementation File
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//
// FILE: cla.h
//
// TITLE: CLA Driver Implementation File
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clapromcrc.c
//
// FILE: clapromcrc.c
//
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// $
./CycloneMCU App/src/driverlib/clapromcrc.h
clapromcrc.h
// FILE: clapromcrc.h
//
// TITLE: C28x and CLA CLAPROMCRC driver.
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// $
./CycloneMCU_App/src/driverlib/cmpss.c
cmpss.c
//
// FILE:
         cmpss.c
//
```

```
// TITLE: C28x CMPSS driver.
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// $
./CycloneMCU App/src/driverlib/cmpss.h
cmpss.h
//
// FILE: cmpss.h
//
// TITLE: C28x CMPSS driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/cpu.h
cpu.h
//
// FILE: cpu.h
//
// TITLE: Useful C28x CPU defines.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/cputimer.c
cputimer.c
// FILE: cputimer.c
//
// TITLE: C28x CPU timer Driver
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/cputimer.h
cputimer.h
//
// FILE: cputimer.h
//
// TITLE: C28x CPU timer Driver
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/dac.c
```

dac.c

```
//
// FILE: dac.c
//
// TITLE: C28x DAC driver.
//
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// (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE
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./CycloneMCU App/src/driverlib/dac.h
dac.h
//
// FILE: dac.h
//
// TITLE: C28x DAC driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/dcc.c
dcc.c
// FILE: dcc.c
//
// TITLE: C28x DCC driver.
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// $
./CycloneMCU_App/src/driverlib/dcc.h
//
// FILE: dcc.h
//
// TITLE: C28x DCC driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/dcsm.c
//
// FILE: dcsm.c
//
// TITLE: C28x Driver for the DCSM security module.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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```
./CycloneMCU App/src/driverlib/dcsm.h
dcsm.h
//
// FILE: dcsm.h
//
// TITLE: C28x Driver for the DCSM security module.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/debug.h
debug.h
// FILE: debug.h
//
// TITLE: Assert definition macro for debug.
//
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./CycloneMCU_App/src/driverlib/device.h
device.h
//
// FILE: device.h
//
// TITLE: Device setup for examples.
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//
// FILE: dma.c
//
// TITLE: C28x DMA driver.
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./CycloneMCU App/src/driverlib/dma.h
dma.h
//
// FILE: dma.h
//
// TITLE: C28x DMA driver.
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// $
./CycloneMCU App/src/driverlib/driverlib.h
driverlib.h
//
// FILE: driverlib.h
//
// TITLE: C28x Driverlib Header File
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
./CycloneMCU App/src/driverlib/ecap.c
//
```

```
// FILE: ecap.c
//
// TITLE: C28x ECAP driver
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_App/src/driverlib/ecap.h
ecap.h
//
// FILE: ecap.h
//
// TITLE: C28x ECAP driver
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/epwm.c
epwm.c
//
// FILE: epwm.c
//
// TITLE: C28x EPWM driver.
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// $
./CycloneMCU App/src/driverlib/epwm.h
epwm.h
//
// FILE: epwm.h
//
// TITLE: C28x EPWM Driver
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/eqep.c
egep.c
//
// FILE: eqep.c
//
// TITLE: C28x eQEP driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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```

```
./CycloneMCU_App/src/driverlib/eqep.h
eaep.h
//
// FILE: egep.h
//
// TITLE: C28x eQEP driver.
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// $
./CycloneMCU App/src/driverlib/f28004x adc.h
f28004x adc.h
//
// FILE:
        f28004x_adc.h
// TITLE: ADC Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/f28004x analogsubsys.h
f28004x analogsubsys.h
//
// FILE: f28004x analogsubsys.h
//
// TITLE: ANALOGSUBSYS Register Definitions.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/f28004x_can.h
f28004x can.h
//
// FILE: f28004x can.h
//
// TITLE: CAN Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_App/src/driverlib/f28004x_cla.h
f28004x cla.h
//
// FILE: f28004x cla.h
//
// TITLE: CLA Register Definitions.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/f28004x cla prom crc32.h
f28004x cla prom crc32.h
//
// FILE:
         f28004x_cla_prom_crc32.h
//
// TITLE: CLA_PROM_CRC32 Register Definitions.
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// $
./CycloneMCU_App/src/driverlib/f28004x_cmpss.h
f28004x cmpss.h
//
// FILE:
         f28004x cmpss.h
//
```

```
// TITLE: CMPSS Register Definitions.
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./CycloneMCU App/src/driverlib/f28004x cputimer.h
f28004x cputimer.h
//
// FILE: f28004x cputimer.h
//
// TITLE: CPUTIMER Register Definitions.
//
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./CycloneMCU App/src/driverlib/f28004x dac.h
f28004x dac.h
//
// FILE:
          f28004x dac.h
//
// TITLE: DAC Register Definitions.
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// $
./CycloneMCU App/src/driverlib/f28004x dcc.h
f28004x dcc.h
//
// FILE: f28004x_dcc.h
//
// TITLE: DCC Register Definitions.
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// $
./CycloneMCU_App/src/driverlib/f28004x_dcsm.h
f28004x dcsm.h
//
// FILE: f28004x dcsm.h
//
// TITLE: DCSM Register Definitions.
//
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// $
./CycloneMCU App/src/driverlib/f28004x device.h
```

f28004x\_device.h

```
//
// FILE: F28004x device.h
//
// TITLE: F28004x Device Definitions.
//
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./CycloneMCU App/src/driverlib/f28004x dma.h
f28004x dma.h
//
// FILE: f28004x_dma.h
//
// TITLE: F28004x Device DMA Register Definitions.
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// $
./CycloneMCU App/src/driverlib/f28004x ecap.h
f28004x ecap.h
// FILE: f28004x_ecap.h
//
// TITLE: ECAP Register Definitions.
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./CycloneMCU_App/src/driverlib/f28004x_epwm.h
f28004x epwm.h
//
// FILE:
         f28004x epwm.h
//
// TITLE: EPWM Register Definitions.
//
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// $
./CycloneMCU App/src/driverlib/f28004x epwm xbar.h
f28004x epwm xbar.h
//
// FILE: f28004x epwm xbar.h
//
// TITLE: EPWM_XBAR Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
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```
./CycloneMCU App/src/driverlib/f28004x eqep.h
f28004x egep.h
//
// FILE:
         f28004x_eqep.h
//
// TITLE: EQEP Register Definitions.
//
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./CycloneMCU_App/src/driverlib/f28004x_erad.h
f28004x erad.h
// FILE: f28004x erad.h
//
// TITLE: ERAD Register Definitions.
//
```

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./CycloneMCU App/src/driverlib/f28004x flash.h
f28004x flash.h
//
// FILE: f28004x_flash.h
//
// TITLE: FLASH Register Definitions.
//
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// $
./CycloneMCU App/src/driverlib/f28004x_fsi.h
f28004x fsi.h
//
// FILE: f28004x_fsi.h
//
// TITLE: FSI Register Definitions.
//
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./CycloneMCU App/src/driverlib/f28004x gpio.h
f28004x_gpio.h
//
// FILE:
          f28004x gpio.h
//
// TITLE: GPIO Register Definitions.
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./CycloneMCU_App/src/driverlib/f28004x_i2c.h
f28004x i2c.h
//
// FILE:
         f28004x i2c.h
//
// TITLE: I2C Register Definitions.
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./CycloneMCU App/src/driverlib/f28004x input xbar.h
f28004x input xbar.h
//
```

```
// FILE:
         f28004x_input_xbar.h
//
// TITLE:
          INPUT XBAR Register Definitions.
//
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f28004x lin.h
//
// FILE: f28004x lin.h
//
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// $
./CycloneMCU App/src/driverlib/f28004x nmiintrupt.h
f28004x nmiintrupt.h
//
// FILE:
          f28004x_nmiintrupt.h
//
// TITLE:
          NMIINTRUPT Register Definitions.
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
./CycloneMCU App/src/driverlib/f28004x output xbar.h
f28004x output xbar.h
//
// FILE: f28004x_output_xbar.h
//
// TITLE: OUTPUT XBAR Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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```

```
./CycloneMCU_App/src/driverlib/f28004x_pga.h
f28004x pga.h
//
// FILE:
          f28004x pga.h
//
// TITLE: PGA Register Definitions.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/f28004x piectrl.h
f28004x piectrl.h
//
// FILE:
        f28004x_piectrl.h
// TITLE:
         PIECTRL Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
```

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// $
./CycloneMCU App/src/driverlib/f28004x pievect.h
f28004x pievect.h
//
// FILE: f28004x pievect.h
//
// TITLE: F28004x Device PIE Vector Table Definitions
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/f28004x_pmbus.h
f28004x pmbus.h
//
// FILE:
         f28004x pmbus.h
//
// TITLE: PMBUS Register Definitions.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_App/src/driverlib/f28004x_sci.h
f28004x sci.h
//
// FILE: f28004x sci.h
//
// TITLE: SCI Register Definitions.
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./CycloneMCU App/src/driverlib/f28004x sdfm.h
f28004x sdfm.h
//
// FILE: f28004x_sdfm.h
//
// TITLE: SDFM Register Definitions.
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// $
./CycloneMCU_App/src/driverlib/f28004x_spi.h
f28004x spi.h
//
// FILE: f28004x spi.h
//
```

```
// TITLE: SPI Register Definitions.
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// $
./CycloneMCU App/src/driverlib/f28004x sysctrl.h
f28004x sysctrl.h
//
// FILE: f28004x sysctrl.h
//
// TITLE: SYSCTRL Register Definitions.
//
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./CycloneMCU App/src/driverlib/f28004x xbar.h
f28004x xbar.h
//
// FILE:
          f28004x xbar.h
//
// TITLE: XBAR Register Definitions.
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./CycloneMCU App/src/driverlib/f28004x xint.h
f28004x xint.h
//
// FILE: f28004x_xint.h
//
// TITLE: XINT Register Definitions.
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./CycloneMCU_App/src/driverlib/flash.c
flash.c
//
// FILE: flash.c
//
// TITLE: C28x Flash driver.
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// $
./CycloneMCU App/src/driverlib/flash.h
flash.h
```

```
//
// FILE: flash.h
//
// TITLE: C28x Flash driver.
//
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./CycloneMCU App/src/driverlib/fsi.c
fsi.c
//
// FILE: fsi.c
//
// TITLE: C28x FSI driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/fsi.h
fsi.h
// FILE: fsi.h
//
// TITLE: C28x FSI Driver API header file
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// $
./CycloneMCU_App/src/driverlib/gpio.c
//
// FILE: gpio.c
//
// TITLE: C28x GPIO driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
./CycloneMCU App/src/driverlib/gpio.h
gpio.h
//
// FILE: gpio.h
//
// TITLE: C28x GPIO driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
```

```
./CycloneMCU App/src/driverlib/hrcap.c
hrcap.c
//
// FILE: hrcap.c
//
// TITLE: C28x HRCAP driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/hrcap.h
hrcap.h
// FILE: hrcap.h
//
// TITLE: C28x HRCAP Driver.
//
```

```
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// $
./CycloneMCU_App/src/driverlib/hrpwm.c
//
// FILE: hrpwm.c
//
// TITLE: C28x HRPWM driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/hrpwm.h
hrpwm.h
//
// FILE: hrpwm.h
//
// TITLE: C28x HRPWM Driver
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/i2c.c
i2c.c
//
// FILE: i2c.c
//
// TITLE: C28x I2C driver.
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// $
./CycloneMCU App/src/driverlib/i2c.h
i2c.h
//
// FILE: i2c.h
//
// TITLE: C28x I2C driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/inc/hw adc.h
//
```

```
// FILE:
          hw_adc.h
//
// TITLE:
          Definitions for the ADC registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_App/src/driverlib/inc/hw_asysctl.h
hw asysctl.h
//
// FILE:
          hw asysctl.h
//
// TITLE:
          Definitions for the ASYSCTL registers.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/inc/hw_can.h
hw_can.h
//
// FILE:
          hw_can.h
//
// TITLE: Definitions for the CAN registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw cla.h
hw cla.h
//
// FILE:
          hw_cla.h
//
// TITLE: Definitions for the CLA registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw clapromcrc.h
hw clapromcrc.h
//
// FILE: hw_clapromcrc.h
//
// TITLE: Definitions for the CLAPROMCRC registers.
//
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```
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hw cmpss.h
//
// FILE:
          hw cmpss.h
//
// TITLE: Definitions for the CMPSS registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw cputimer.h
hw cputimer.h
//
// FILE:
         hw_cputimer.h
// TITLE: Definitions for the CPUTIMER registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/inc/hw dac.h
hw dac.h
//
// FILE:
          hw dac.h
//
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// $
./CycloneMCU_App/src/driverlib/inc/hw_dcc.h
hw dcc.h
//
// FILE:
         hw dcc.h
//
// TITLE: Definitions for the DCC registers.
//
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./CycloneMCU_App/src/driverlib/inc/hw_dcsm.h
hw dcsm.h
//
// FILE:
          hw dcsm.h
//
// TITLE: Definitions for the DCSM registers.
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./CycloneMCU App/src/driverlib/inc/hw dma.h
hw dma.h
// FILE:
         hw_dma.h
//
// TITLE: Definitions for the DMA registers.
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// $
./CycloneMCU_App/src/driverlib/inc/hw_ecap.h
hw ecap.h
//
// FILE:
          hw ecap.h
//
```

```
// TITLE: Definitions for the ECAP registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw epwm.h
hw epwm.h
//
// FILE:
         hw epwm.h
//
// TITLE: Definitions for the EPWM registers.
//
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./CycloneMCU App/src/driverlib/inc/hw epwmxbar.h
hw epwmxbar.h
//
// FILE:
          hw epwmxbar.h
//
// TITLE: Definitions for the XBAR registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw eqep.h
hw eqep.h
// FILE:
          hw_eqep.h
//
// TITLE: Definitions for the EQEP registers.
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// $
./CycloneMCU_App/src/driverlib/inc/hw_erad.h
hw erad.h
//
// FILE:
         hw erad.h
//
// TITLE: Definitions for the ERAD registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw flash.h
hw_flash.h
```

```
//
// FILE:
         hw flash.h
//
// TITLE: Definitions for the FLASH registers.
//
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hw fsi.h
//
// FILE:
         hw_fsi.h
//
// TITLE: Definitions for the FSI registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw gpio.h
hw_gpio.h
// FILE:
         hw_gpio.h
//
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./CycloneMCU_App/src/driverlib/inc/hw_hrcap.h
//
// FILE: hw_hrcap.h
//
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./CycloneMCU App/src/driverlib/inc/hw hrpwm.h
hw hrpwm.h
//
// FILE:
          hw hrpwm.h
//
// TITLE: Definitions for the HRPWM registers.
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```
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hw i2c.h
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// FILE:
         hw i2c.h
//
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// $
./CycloneMCU_App/src/driverlib/inc/hw_inputxbar.h
hw inputxbar.h
// FILE:
         hw inputxbar.h
//
// TITLE: Definitions for the XBAR registers.
//
```

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./CycloneMCU_App/src/driverlib/inc/hw_ints.h
hw ints.h
//
// FILE: hw_ints.h
//
// TITLE: Definitions of interrupt numbers for use with interrupt.c.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/inc/hw lin.h
hw lin.h
//
// FILE:
         hw_lin.h
```

```
//
// TITLE: Definitions for the LIN registers.
//
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// $
./CycloneMCU_App/src/driverlib/inc/hw_memcfg.h
hw memcfg.h
// FILE:
         hw memcfg.h
//
// TITLE: Definitions for the MEMCFG registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw memmap.h
hw memmap.h
//
// FILE: hw memmap.h
//
// TITLE: Macros defining the memory map of the C28x.
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./CycloneMCU_App/src/driverlib/inc/hw_nmi.h
hw nmi.h
//
// FILE:
          hw nmi.h
//
// TITLE: Definitions for the NMI registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/inc/hw outputxbar.h
hw outputxbar.h
//
// FILE:
          hw outputxbar.h
//
// TITLE: Definitions for the XBAR registers.
//
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// $
```

```
hw_pga.h
//
// FILE:
          hw pga.h
//
// TITLE:
          Definitions for the PGA registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw pie.h
//
// FILE: hw_pie.h
//
// TITLE: Definitions for the PIE registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/inc/hw pmbus.h
hw pmbus.h
//
// FILE:
          hw pmbus.h
//
// TITLE:
          Definitions for the PMBUS registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/inc/hw_sci.h
hw_sci.h
//
// FILE:
          hw sci.h
//
// TITLE: Definitions for the SCI registers.
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// $
./CycloneMCU App/src/driverlib/inc/hw sdfm.h
hw sdfm.h
//
// FILE:
          hw_sdfm.h
//
// TITLE: Definitions for the SDFM registers.
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```
// $
./CycloneMCU App/src/driverlib/inc/hw spi.h
hw spi.h
//
// FILE:
        hw_spi.h
//
// TITLE: Definitions for the SPI registers.
//
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hw_sysctl.h
//
// FILE:
         hw sysctl.h
//
// TITLE: Definitions for the SYSCTL registers.
```

```
//
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// $
./CycloneMCU App/src/driverlib/inc/hw types.h
hw types.h
//
// FILE: hw_types.h
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hw xbar.h
//
// FILE:
          hw_xbar.h
//
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hw xint.h
//
// FILE:
         hw xint.h
//
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interrupt.c
//
// FILE: interrupt.c
//
// TITLE: C28x Interrupt (PIE) driver.
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// $
./CycloneMCU App/src/driverlib/interrupt.h
interrupt.h
```

```
//
// FILE: interrupt.h
//
// TITLE: C28x Interrupt (PIE) driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
./CycloneMCU_App/src/driverlib/lin.c
lin.c
//
// FILE: lin.c
//
// TITLE: C28x LIN driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/lin.h
//
// FILE: lin.h
//
// TITLE: C28x LIN driver.
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./CycloneMCU App/src/driverlib/memcfg.c
memcfg.c
//
// FILE: memcfg.c
//
// TITLE: C28x RAM config driver.
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// $
./CycloneMCU App/src/driverlib/memcfg.h
memcfg.h
// FILE: memcfg.h
//
// TITLE: C28x RAM config driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
```

```
./CycloneMCU_App/src/driverlib/pga.c
//
// FILE: pga.c
//
// TITLE: C28x PGA driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/pga.h
pga.h
//
// FILE: pga.h
//
// TITLE: C28x PGA driver.
//
```

```
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./CycloneMCU App/src/driverlib/pin map.h
pin map.h
// FILE: pin_map.h
//
// TITLE: Definitions of pin mux info for gpio.c.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/pmbus.c
pmbus.c
// FILE: pmbus.c
//
// TITLE: C28x PMBUS driver
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/pmbus.h
//
// FILE: pmbus.h
//
// TITLE: C28x PMBUS Driver
//
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./CycloneMCU App/src/driverlib/sci.c
//
// FILE: sci.c
//
// TITLE: C28x SCI driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU App/src/driverlib/sci.h
sci.h
//
// FILE: sci.h
```

```
//
// TITLE: C28x SCI driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_App/src/driverlib/sdfm.c
sdfm.c
// FILE: sdfm.c
//
// TITLE: C28x SDFM Driver
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// $
./CycloneMCU App/src/driverlib/sdfm.h
//
// FILE: sdfm.h
//
// TITLE: C28x SDFM Driver
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//
// FILE: spi.c
//
// TITLE: C28x SPI driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/spi.h
spi.h
//
// FILE: spi.h
//
// TITLE: C28x SPI driver.
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```
sysctl.c
// FILE: sysctl.c
//
// TITLE: C28x system control driver.
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// $
./CycloneMCU App/src/driverlib/sysctl.h
//
// FILE: sysctl.h
//
// TITLE: C28x system control driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
```

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./CycloneMCU App/src/driverlib/version.c
version.c
//
// FILE: version.c
//
// TITLE: API to return the version number of the driverlib.lib in use.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
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version.h
//
// FILE: version.h
//
// TITLE: API to return the version number of the driverlib.lib in use.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU App/src/driverlib/xbar.c
xbar.c
//
// FILE: xbar.c
//
// TITLE: C28x X-BAR driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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```
// $
./CycloneMCU App/src/driverlib/xbar.h
xbar.h
//
// FILE: xbar.h
//
// TITLE: C28x X-BAR driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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drv8350.h
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hal.h
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// $
./CycloneMCU App/src/hardware/hal data.h
hal data.h
//
// FILE: hal_data.h
//
// TITLE: C28x InstaSPIN hardware abstraction layer (HAL) library
//
//
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hal_obj.h
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./CycloneMCU App/src/hardware/labs.h
labs.h
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./CycloneMCU App/src/hardware/user.h
user.h
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./CycloneMCU App/src/libraries/angle gen/include/angle gen.h
angle gen.h
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./CycloneMCU App/src/libraries/clarke/include/clarke.h
clarke.h
//
// FILE: clarke.h
//
// TITLE: C28x Clarke transform library
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clarke.c
//
// FILE: clarke.c
//
// TITLE: C28x Clarke transform library
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cpu time.h
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cpu_time.c
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```

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// $
./CycloneMCU App/src/libraries/ctrl/include/ctrl obj.h
ctrl obj.h
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// $
./CycloneMCU_App/src/libraries/ctrl/include/ctrl_states.h
ctrl states.h
//
// FILE: ctrl states.h
//
// TITLE: C28x InstaSPIN controller (CTRL) state library
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
./CycloneMCU_App/src/libraries/ctrl/source/ctrl.c
ctrl.c
//
// FILE: ctrl.c
//
// TITLE: C28x InstaSPIN control (CTRL) library (floating point)
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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datalog.h
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./CycloneMCU App/src/libraries/datalog/include/dlog 4ch f.h
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./CycloneMCU App/src/libraries/datalog/source/datalog.c
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est.h
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./CycloneMCU App/src/libraries/est/include/est Flux states.h
est Flux states.h
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est Ls states.h
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./CycloneMCU_App/src/libraries/est/include/est_Rr_states.h
est Rr states.h
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est Rs states.h
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// $
./CycloneMCU_App/src/libraries/est/include/est_states.h
est states.h
// FILE: est.h
//
// TITLE: C28x InstaSPIN estimator module states
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./CycloneMCU App/src/libraries/est/include/est Traj states.h
est Traj states.h
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// $
./CycloneMCU App/src/libraries/est/include/motor.h
motor.h
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
./CycloneMCU App/src/libraries/est/include/userParams.h
userParams.h
```

```
//
// FILE: userParams.h
//
// TITLE: C28x InstaSPIN public interface for user initialization data for the
         CTRL, DRV, and EST modules (floating point)
//
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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./CycloneMCU App/src/libraries/est/source/user.c
user.c
//
// FILE: user.c
//
// TITLE: C28x InstaSPIN function for setting initialization data for the
         CTRL, HAL, and EST modules (floating point)
//
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:49 CDT 2019 $
```

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./CycloneMCU App/src/libraries/filter/filter fo/include/filter fo.h
filter fo.h
//
// FILE: filter fo.h
//
// TITLE: C28x InstaSPIN filter library, first-order
//
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:48 CDT 2019 $
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// $
./CycloneMCU App/src/libraries/filter/filter fo/source/filter fo.c
filter_fo.c
//
// FILE: filter_fo.c
//
// TITLE: C28x InstaSPIN filter library, first-order
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:48 CDT 2019 $
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// $
./CycloneMCU App/src/libraries/filter/filter so/include/filter so.h
filter so.h
//
// FILE: filter_so.h
//
// TITLE: C28x InstaSPIN filter library, second-order
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```

```
// $
./CycloneMCU App/src/libraries/filter/filter so/source/filter so.c
filter so.c
//
// FILE: filter_so.c
//
// TITLE: C28x InstaSPIN filter library, second-order
//
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./CycloneMCU_App/src/libraries/filter/offset/include/offset.h
offset.h
//
// FILE: offset.h
//
// TITLE: C28x InstaSPIN offset library (floating point)
```

```
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
./CycloneMCU App/src/libraries/filter/offset/source/offset.c
offset.c
//
// FILE: offset.c
// TITLE: C28x InstaSPIN offset library (floating point)
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// $
./CycloneMCU App/src/libraries/fwc/include/fwc.h
fwc.h
//
// FILE: fwc.h
//
// TITLE: C28x Field Weakening Control (FWC) library (floating point)
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:48 CDT 2019 $
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// $
./CycloneMCU_App/src/libraries/fwc/source/fwc.c
//
// FILE: fwc.c
//
// TITLE: C28x Field Weakening Control (FWC) library (floating point)
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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./CycloneMCU_App/src/libraries/ipark/include/ipark.h
ipark.h
//
// FILE: ipark.h
//
// TITLE: C28x InstaSPIN inverse park transform library
// $TI Release: MotorControl SDK v2.00.00.00 $
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./CycloneMCU App/src/libraries/ipark/source/ipark.c
ipark.c
```

```
//
// FILE: ipark.c
//
// TITLE: C28x InstaSPIN inverse park transform library
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
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math.h
//
// FILE: math.h
//
// TITLE: C28x math library (floating point)
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
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//
// FILE: mtpa.h
//
// TITLE: C28x Maximum torque per ampere (MTPA) (floating point)
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mtpa.c
//
// FILE: mtpa.c
//
// TITLE: C28x Maximum Torque Per Ampere (MTPA)
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// $Release Date: Wed Jun 19 14:21:48 CDT 2019 $
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// $
./CycloneMCU App/src/libraries/park/include/park.h
park.h
// FILE: park.h
//
// TITLE: C28x InstaSPIN park transform library (fixed point)
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
```

```
./CycloneMCU_App/src/libraries/park/source/park.c
//
// FILE: park.c
//
// TITLE: C28x InstaSPIN park transform library (floating point)
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:49 CDT 2019 $
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// $
./CycloneMCU App/src/libraries/pi/include/pi.h
pi.h
//
// FILE: pi.h
//
// TITLE: C28x InstaSPIN Proportional-Integral (PI) controller library
         (floating point)
//
//
```

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// $
./CycloneMCU App/src/libraries/pi/source/pi.c
//
// FILE:
         pi.c
//
// TITLE: C28x InstaSPIN Proportional-Integral (PI) controller library
//
         (floating point)
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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// $
./CycloneMCU App/src/libraries/svgen/include/svgen.h
svgen.h
//
// FILE: svgen.h
//
// TITLE: C28x InstaSPIN Space Vector Generator (SVGEN) library
          (floating point)
//
//
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// $
./CycloneMCU App/src/libraries/svgen/include/svgen current.h
svgen current.h
// FILE: svgen_current.h
//
// TITLE: C28x InstaSPIN Space Vector Generator (SVGEN) library
//
          (floating point)
//
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// $
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svgen.c
//
// FILE: svgen.c
//
// TITLE: C28x InstaSPIN Space Vector Generator (SVGEN) library
//
         (floating point)
//
// $TI Release: MotorControl SDK v2.00.00.00 $
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```

```
./CycloneMCU_App/src/libraries/svgen/source/svgen_current.c
svgen current.c
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traj.h
//
// FILE: traj.h
//
// TITLE: C28x InstaSPIN trajectory library (floating point)
//
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./CycloneMCU App/src/libraries/traj/source/traj.c
traj.c
//
// FILE: traj.c
//
// TITLE: C28x InstaSPIN trajectory library (floating point)
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./CycloneMCU App/src/libraries/types/include/types.h
types.h
// FILE: types.h
//
// TITLE: C28x type definitions library
// $TI Release: MotorControl SDK v2.00.00.00 $
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./CycloneMCU_App/src/libraries/vsf/include/vsf.h
vsf.h
//
// FILE: vsf.h
//
// TITLE: varibale switching pwm frequency
//
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vsf.c
```

```
//
// FILE: vsf.c
//
// TITLE: variable switching frequency (VSF)
//
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vs freq.h
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vs frea.c
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// $
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main.c
//main.c
./CycloneMCU App/src/mcu board/drv8350.c
drv8350.c
// $TI Release: MotorControl SDK v2.00.00.00 $
// $Release Date: Wed Jun 19 14:21:50 CDT 2019 $
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```

```
./CycloneMCU_App/src/mcu_board/hal.c
hal.c
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// $
./CycloneMCU App/src/mcu board/mcu board sci.h
mcu board sci.h
/*
* mcu_board_sci.h
  Created on: 5 Mar 2020
*
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_board/rayHAL.c
rayHAL.c
/*
 * rayHAL.c
   Created on: 16 Dec 2019
       Author: pwebb
```

```
*/
./CycloneMCU_App/src/mcu_board/rayHAL.h
rayHAL.h
 * rayHAL.h
 * Created on: 16 Dec 2019
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_board/RayMCUPinAllocations.h
RayMCUPinAllocations.h
 * RayMCUPinAllocations.h
 * Created on: 22 Nov 2019
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_board/RayMCUTypes.h
RayMCUTypes.h
* RayMCUTypes.h
 * Created on: 22 Nov 2019
       Author: pwebb
./CycloneMCU_App/src/mcu_boost/boostClock.c
boostClock.c
 * boostClock.c
   Created on: 16 Dec 2019
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_boost/boostClock.h
boostClock.h
/*
 * boostClock.h
   Created on: 16 Dec 2019
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_boost/boostEnable.c
boostEnable.c
/*
 * boostEnable.c
   Created on: 16 Dec 2019
        Author: pwebb
```

```
*/
./CycloneMCU_App/src/mcu_boost/boostEnable.h
boostEnable.h
 * boostEnable.h
 * Created on: 16 Dec 2019
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_boost/boostSupply.c
boostSupply.c
/*
 * boostSupply.c
   Created on: 16 Dec 2019
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_boost/boostSupply.h
boostSupply.h
 * boostSupply.h
 * Created on: 16 Dec 2019
        Author: pwebb
./CycloneMCU_App/src/mcu_cli/mcu_cli.c
mcu_cli.c
 * mcu_cli.c
   Created on: 4 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_cli/mcu_cli.h
mcu_cli.h
/*
 * mcu_cli.h
   Created on: 4 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_cli/mcu_cli_commands.h
mcu_cli_commands.h
 * mcu_cli_commands.h
   Created on: 5 Mar 2020
        Author: pwebb
```

```
*/
./CycloneMCU_App/src/mcu_cli/mcu_cli_parser.h
mcu_cli_parser.h
 * mcu_cli_parser.h
 * Created on: 5 Mar 2020
 *
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_data/mcu_data_store.c
mcu_data_store.c
/*
 * mcu_data_read.c
   Created on: 5 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_data/mcu_data_store.h
mcu_data_store.h
 * mcu_data_store.h
   Created on: 5 Mar 2020
        Author: pwebb
./CycloneMCU_App/src/mcu_eeprom/mcu_eeprom.c
mcu_eeprom.c
 * mcu_eeprom.c
   Created on: 9 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_eeprom/mcu_eeprom.h
mcu_eeprom.h
/*
 * mcu_eeprom.h
   Created on: 9 Mar 2020
        Author: pwebb
 */
//TI Board EEPROM DETAILS
./CycloneMCU_App/src/mcu_errorHandler/mcu_errorHandler.c
mcu errorHandler.c
/*
 * mcu_led.c
  Created on: 10 Jul 2020
```

```
Author: pwebb
 */
./CycloneMCU_App/src/mcu_errorHandler/mcu_errorHandler.h
mcu errorHandler.h
/*
 * mcu_led.h
 * Created on: 10 Jul 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_I2C/mcu_i2c.c
mcu_i2c.c
/*
 * mcu_i2c.c
   Created on: 25 Feb 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_I2C/mcu_i2c.h
mcu_i2c.h
/*
 * mcu_i2c.h
 * Created on: 25 Feb 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_I2C/mcu_i2c_data.h
mcu_i2c_data.h
 * mcu_i2c_data.h
   Created on: 2 Mar 2020
        Author: pwebb
 */
// Defines
//
./CycloneMCU_App/src/mcu_I2C/mcu_i2c_int.h
mcu_i2c_int.h
/*
 * mcu_i2c_int.h
 * Created on: 2 Mar 2020
 *
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/crc16.c
crc16.c
/*
```

```
* crc16.c
   Created on: 21 Feb 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/crc16.h
crc16.h
 * crc16.h
 * Created on: 21 Feb 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/mcu_psu_messages.c
mcu_psu_messages.c
 * mcu_psu_messages.c
   Created on: 11 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/mcu_psu_messages.h
mcu_psu_messages.h
/*
 * mcu_psu_messages.h
   Created on: 11 Mar 2020
       Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/psu_interface.c
psu_interface.c
/*
 * psu_interface.c
 * Created on: 2 Jan 2020
 *
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_psuIF/psu_interface.h
psu_interface.h
/*
 * psu_interface.h
 * Created on: 2 Jan 2020
 *
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_timer/timer.c
timer.c
/*
```

```
* timer.c
   Created on: 16 Dec 2019
        Author: pwebb
 */
./CycloneMCU_App/src/mcu_timer/timer.h
timer.h
 * timer.h
 * Created on: 16 Dec 2019
        Author: pwebb
 */
./CycloneMCU_App/src/MotorDriver/MotorDriver.c
MotorDriver.c
 * MotorDriver.c
*/
//
// solutions
//
./CycloneMCU_App/src/MotorDriver/MotorDriver.h
MotorDriver.h
/*
 * motorDriver.h
   Created on: 2 Jul 2019
        Author: pwebb
 */
./CycloneMCU_App/src/MotorDriver/MotorDriver_cntrl.h
MotorDriver_cntrl.h
/*
 * MotorDriver.c
*/
//
// solutions
//
./CycloneMCU_App/src/MotorDriver/MotorDriver_HAL.h
MotorDriver HAL.h
 * MotorDriver_HAL.h
 * Created on: 4 Mar 2020
        Author: pwebb
 */
./CycloneMCU_App/src/MotorDriver/MotorDriver_POS.h
MotorDriver_POS.h
/*
```

```
* motorDriver_POS.h
   Created on: 2 Jul 2019
 *
       Author: pwebb
 */
./CycloneMCU_App/src/MotorDriver/MotorDriver_QEP.h
MotorDriver_QEP.h
* motorDriver_QEP.h
  Created on: 2 Jul 2019
       Author: pwebb
 */
/**
 * structure holding information about the quadrature encoder interface
./CycloneMCU App/src/MotorDriver/MotorDriver Variables.h
MotorDriver_Variables.h
/*
 * motorDriver.h
   Created on: 2 Jul 2019
       Author: pwebb
 */
./CycloneMCU App/src/src device/f28004x globalvariabledefs.c
f28004x globalvariabledefs.c
//
// FILE: f28004x_globalvariabledefs.c
//
// TITLE:
          F28004x Global Variables and Data Section Pragmas.
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Fri May 24 03:33:32 CDT 2019 $
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// $
./CycloneMCU_UpgradeKernel/src/device/device.c
device.c
//
// FILE: device.c
//
// TITLE: Device setup for examples.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Mon May 27 06:42:25 CDT 2019 $
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device.h
//
// FILE: device.h
//
// TITLE: Device setup for examples.
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Mon May 27 06:42:25 CDT 2019 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/adc.h
adc.h
```

```
//
// FILE: adc.h
//
// TITLE: C28x ADC driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/asysctl.h
asysctl.h
//
// FILE: asysctl.h
//
// TITLE: C28x driver for Analog System Control.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/can.h
//
// FILE: can.h
//
// TITLE: C28x CAN driver.
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./CycloneMCU UpgradeKernel/src/device/driverlib/cla.h
cla.h
//
// FILE: cla.h
//
// TITLE: CLA Driver Implementation File
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/clapromcrc.h
clapromcrc.h
// FILE: clapromcrc.h
//
// TITLE: C28x and CLA CLAPROMCRC driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
```

```
./CycloneMCU_UpgradeKernel/src/device/driverlib/cmpss.h
cmpss.h
//
// FILE: cmpss.h
//
// TITLE: C28x CMPSS driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/cpu.h
cpu.h
//
// FILE: cpu.h
//
// TITLE: Useful C28x CPU defines.
//
```

```
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./CycloneMCU UpgradeKernel/src/device/driverlib/cputimer.h
cputimer.h
// FILE: cputimer.h
//
// TITLE: C28x CPU timer Driver
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/dac.h
dac.h
// FILE: dac.h
//
// TITLE: C28x DAC driver.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/dcc.h
//
// FILE: dcc.h
//
// TITLE: C28x DCC driver.
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/dcsm.h
//
// FILE: dcsm.h
//
// TITLE: C28x Driver for the DCSM security module.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU UpgradeKernel/src/device/driverlib/debug.h
debug.h
//
// FILE:
         debug.h
```

```
//
// TITLE: Assert definition macro for debug.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/dma.h
dma.h
// FILE: dma.h
//
// TITLE: C28x DMA driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/ecap.h
//
// FILE: ecap.h
//
// TITLE: C28x ECAP driver
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./CycloneMCU_UpgradeKernel/src/device/driverlib/epwm.h
//
// FILE: epwm.h
//
// TITLE: C28x EPWM Driver
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/eqep.h
eqep.h
//
// FILE: eqep.h
//
// TITLE: C28x eQEP driver.
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// $
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```
flash.h
//
// FILE: flash.h
//
// TITLE: C28x Flash driver.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/fsi.h
//
// FILE: fsi.h
//
// TITLE: C28x FSI Driver API header file
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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gpio.h
//
// FILE: gpio.h
//
// TITLE: C28x GPIO driver.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/hrcap.h
hrcap.h
//
// FILE: hrcap.h
//
// TITLE: C28x HRCAP Driver.
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./CycloneMCU UpgradeKernel/src/device/driverlib/hrpwm.h
hrpwm.h
//
// FILE: hrpwm.h
//
// TITLE: C28x HRPWM Driver
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```
// $
./CycloneMCU UpgradeKernel/src/device/driverlib/i2c.h
i2c.h
//
// FILE: i2c.h
//
// TITLE: C28x I2C driver.
//
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_adc.h
hw_adc.h
//
// FILE:
         hw adc.h
//
// TITLE: Definitions for the ADC registers.
```

```
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw asysctl.h
hw asysctl.h
//
// FILE:
          hw_asysctl.h
// TITLE: Definitions for the ASYSCTL registers.
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw can.h
hw can.h
//
// FILE:
          hw_can.h
//
// TITLE: Definitions for the CAN registers.
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_cla.h
hw cla.h
//
// FILE:
         hw cla.h
//
// TITLE: Definitions for the CLA registers.
//
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_clapromcrc.h
hw clapromcrc.h
//
// FILE:
          hw clapromcrc.h
//
// TITLE: Definitions for the CLAPROMCRC registers.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw cmpss.h
hw cmpss.h
```

```
//
// FILE:
          hw_cmpss.h
//
// TITLE: Definitions for the CMPSS registers.
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_cputimer.h
hw cputimer.h
//
// FILE:
          hw cputimer.h
//
// TITLE: Definitions for the CPUTIMER registers.
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_dac.h
hw dac.h
//
// FILE:
         hw dac.h
//
// TITLE: Definitions for the DAC registers.
//
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hw dcc.h
//
// FILE:
          hw_dcc.h
//
// TITLE: Definitions for the DCC registers.
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw dcsm.h
hw dcsm.h
// FILE:
         hw dcsm.h
//
// TITLE: Definitions for the DCSM registers.
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```
./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_dma.h
hw dma.h
//
// FILE:
          hw dma.h
//
// TITLE:
         Definitions for the DMA registers.
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw ecap.h
hw ecap.h
//
// FILE:
        hw ecap.h
//
// TITLE:
         Definitions for the ECAP registers.
//
```

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hw epwm.h
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// FILE:
          hw epwm.h
//
// TITLE: Definitions for the EPWM registers.
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw epwmxbar.h
hw epwmxbar.h
// FILE:
          hw epwmxbar.h
//
// TITLE: Definitions for the XBAR registers.
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//
// FILE:
          hw_eqep.h
//
// TITLE: Definitions for the EQEP registers.
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hw erad.h
//
// FILE:
         hw erad.h
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw flash.h
hw_flash.h
//
// FILE:
          hw_flash.h
```

```
//
// TITLE: Definitions for the FLASH registers.
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw fsi.h
hw fsi.h
// FILE: hw fsi.h
//
// TITLE: Definitions for the FSI registers.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw gpio.h
hw gpio.h
//
// FILE:
         hw_gpio.h
//
// TITLE: Definitions for the GPIO registers.
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_hrcap.h
hw hrcap.h
//
// FILE:
          hw hrcap.h
//
// TITLE: Definitions for the HRCAP registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw hrpwm.h
hw hrpwm.h
//
// FILE:
          hw hrpwm.h
//
// TITLE: Definitions for the HRPWM registers.
//
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// $
```

```
hw i2c.h
//
// FILE:
         hw i2c.h
//
// TITLE:
         Definitions for the I2C registers.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw inputxbar.h
hw inputxbar.h
//
// FILE: hw_inputxbar.h
//
// TITLE: Definitions for the XBAR registers.
//
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw ints.h
hw ints.h
//
// FILE: hw ints.h
//
// TITLE: Definitions of interrupt numbers for use with interrupt.c.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_lin.h
hw lin.h
// FILE:
         hw lin.h
//
// TITLE: Definitions for the LIN registers.
//
```

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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_memcfg.h
hw memcfg.h
//
// FILE:
          hw memcfg.h
//
// TITLE: Definitions for the MEMCFG registers.
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw memmap.h
hw memmap.h
//
// FILE:
          hw_memmap.h
//
// TITLE: Macros defining the memory map of the C28x.
//
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw nmi.h
hw nmi.h
//
// FILE:
          hw nmi.h
//
// TITLE: Definitions for the NMI registers.
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw outputxbar.h
hw outputxbar.h
//
// FILE:
          hw outputxbar.h
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw pga.h
//
```

```
// FILE:
          hw_pga.h
//
// TITLE:
          Definitions for the PGA registers.
//
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hw pie.h
//
// FILE:
          hw pie.h
//
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./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw pmbus.h
hw_pmbus.h
//
// FILE:
          hw_pmbus.h
//
// TITLE: Definitions for the PMBUS registers.
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// $
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hw sci.h
//
// FILE:
          hw_sci.h
//
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw sdfm.h
hw sdfm.h
//
// FILE:
         hw_sdfm.h
//
// TITLE: Definitions for the SDFM registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Mon May 27 06:42:25 CDT 2019 $
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```

```
./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_spi.h
hw spi.h
//
// FILE:
          hw spi.h
//
// TITLE: Definitions for the SPI registers.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw sysctl.h
hw sysctl.h
//
// FILE:
         hw_sysctl.h
// TITLE: Definitions for the SYSCTL registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $Release Date: Mon May 27 06:42:25 CDT 2019 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/inc/hw types.h
hw types.h
//
// FILE: hw types.h
//
// TITLE: Type definitions used in driverlib functions.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_xbar.h
hw xbar.h
//
// FILE:
         hw xbar.h
//
// TITLE: Definitions for the XBAR registers.
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU_UpgradeKernel/src/device/driverlib/inc/hw_xint.h
hw xint.h
//
// FILE:
          hw xint.h
//
// TITLE: Definitions for the XINT registers.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/interrupt.h
interrupt.h
// FILE: interrupt.h
//
// TITLE: C28x Interrupt (PIE) driver.
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib/lin.h
lin.h
//
// FILE:
         lin.h
//
```

```
// TITLE: C28x LIN driver.
// $TI Release: F28004x Support Library v1.06.00.00 $
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/memcfg.h
memcfg.h
//
// FILE: memcfg.h
//
// TITLE: C28x RAM config driver.
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./CycloneMCU UpgradeKernel/src/device/driverlib/pga.h
pga.h
//
// FILE: pga.h
//
// TITLE: C28x PGA driver.
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// $
./CycloneMCU UpgradeKernel/src/device/driverlib/pin map.h
pin map.h
// FILE: pin_map.h
//
// TITLE: Definitions of pin mux info for gpio.c.
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./CycloneMCU_UpgradeKernel/src/device/driverlib/pmbus.h
pmbus.h
//
// FILE: pmbus.h
//
// TITLE: C28x PMBUS Driver
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```

sci.h

```
//
// FILE: sci.h
//
// TITLE: C28x SCI driver.
//
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sdfm.h
//
// FILE: sdfm.h
//
// TITLE: C28x SDFM Driver
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spi.h
// FILE: spi.h
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//
// FILE: sysctl.h
//
// TITLE: C28x system control driver.
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./CycloneMCU_UpgradeKernel/src/device/driverlib/version.h
version.h
//
// FILE: version.h
//
// TITLE: API to return the version number of the driverlib.lib in use.
//
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// $
```

```
./CycloneMCU UpgradeKernel/src/device/driverlib/xbar.h
xbar.h
//
// FILE: xbar.h
//
// TITLE: C28x X-BAR driver.
//
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// $
./CycloneMCU_UpgradeKernel/src/device/driverlib.h
driverlib.h
// FILE: driverlib.h
//
// TITLE: C28x Driverlib Header File
//
```

```
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// $
./CycloneMCU_UpgradeKernel/src/device/flash_api/f28004x/include/FlashAPI/Constan
ts/Constants.h
Constants.h
/*----*/
/* F021\Constants\Constants.h
/* F021 Flash API v1.56
/*----*/
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/Constan
ts/F28004x.h
F28004x.h
/*----*/
/* F021\Constants\F28004x.h
                                                         */
/* F021 Flash API v1.56
/* F021 Flash API v1.56 */
/*-----*/
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/F021.h
/*----*/
/* F021\F021.h
/* F021 Flash API v1.56
                                                       */
/*----*/
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/F021 F2
8004x C28x.h
F021_F28004x_C28x.h
/*----*/
```

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```
/* F021\F021_F28004x_C28x.h
                                                      */
/* F021 Flash API v1.56
                                                       */
/*----*/
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/Init.h
Init.h
/*----*/
/* F021\Init.h
/* F021 Flash API v1.56
/*----*/
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/Registe
rs.h
Registers.h
/*----*/
/* F021\Registers.h
/* F021 Flash API v1.56 */
/*-----*/
                                                        */
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// $
./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/Registe
rs C28x.h
Registers_C28x.h
/*----*/
/* F021\Registers_C28x.h
/* F021 Flash API v1.56
/*----*/
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./CycloneMCU UpgradeKernel/src/device/flash api/f28004x/include/FlashAPI/Types.h
Types.h
/*----*/
```

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```
*/
/* F02\Types.h
/* F021 Flash API v1.56
/*-----
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// $
./CycloneMCU UpgradeKernel/src/flashapi ex2 boot.c
flashapi ex2 boot.c
//
// FILE:
          flashapi_ex2_boot.c
// TITLE: Boot Source Code
//
// Functions:
//
//
      void copyData(void)
//
      uint32_t getLongData(void)
//
      void readReservedFn(void)
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU UpgradeKernel/src/flashapi ex2 bootrom.h
flashapi ex2 bootrom.h
//
// FILE: flashapi_ex2_bootrom.h
//
// TITLE: BootROM Definitions.
//
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// $
./CycloneMCU UpgradeKernel/src/flashapi ex2 commands.h
flashapi_ex2_commands.h
//
// FILE:
          flashapi ex2 commands.h
//
// TITLE: SCI Kernel Commands
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./CycloneMCU UpgradeKernel/src/flashapi ex2 erase.c
flashapi ex2 erase.c
//
// FILE:
          flashapi_ex2_erase.c
//
// TITLE: Erase Source Code
//
// Functions:
//
      void sharedErase(uint16_t command, uint32 t sectors)
//
//
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./CycloneMCU_UpgradeKernel/src/flashapi_ex2_erase.h
flashapi ex2 erase.h
//
// FILE:
          flashapi ex2 erase.h
//
// TITLE: Erase Header
//
// Functions:
//
//
      void sciErase(Uint32 sectors)
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// $
```

```
./CycloneMCU_UpgradeKernel/src/flashapi_ex2_flash_programming_c28.h
flashapi ex2 flash programming c28.h
//
// FILE:
          flashapi ex2 flash programming C28.h
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// $
./CycloneMCU UpgradeKernel/src/flashapi ex2 ldfu.h
flashapi ex2 ldfu.h
//
// FILE: flashapi_ex2_LDFU.h
//
// TITLE:
         Live DFU Header
//
// $TI Release: F28004x Support Library v1.06.00.00 $
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./CycloneMCU UpgradeKernel/src/flashapi ex2 sci boot.c
flashapi_ex2_sci_boot.c
//
// FILE: flashapi_ex2_sci_boot.c
//
// TITLE: SCI Boot Mode Routines
//
// Functions:
//
      uint32 t sciBoot(void)
//
      void sciaInit(void)
//
      uint32 t sciaGetWordData(void)
//
// Notes:
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// $
./CycloneMCU_UpgradeKernel/src/flashapi_ex2_sci_get_function.c
flashapi ex2 sci get_function.c
//
// FILE:
          flashapi ex2 sci get function.c
//
// TITLE: SCI Kernel Routines
//
// Functions:
//
      uint32_t sciBoot(void)
//
      void sciaInit(void)
//
//
      uint32 t sciaGetWordData(void)
//
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// $
./CycloneMCU UpgradeKernel/src/flashapi ex2 sci kernel.c
flashapi ex2 sci kernel.c
//
// FILE: flashapi_ex2_sciKernel.c
//
// TITLE: SCI Flash Kernel Example for F28004x
//
//! \addtogroup cpu01 example list
//! <h1>SCI Flash Kernel Example for F28004x</h1>
//! In this example, we set up a UART connection with a host using SCI, receive
//! commands for CPU1 to perform which then sends ACK, NAK, and status packets
//! back to the host after receiving and completing the tasks. Each command
//! either expects no data from the command packet or specific data relative
//! to the command.
//!
//! The example has seven build configurations, listed below.
           BANKO LDFU: Only supports the Live Device Firmware Update (LDFU)
//!
//!
                      command for Bank 0; other commands are not supported
//!
                      by this build configuration. For more information about
//!
                      the LDFU command functionality, please read the
documentation
//!
                      in 'flashapi_ex2_LDFU.c'. Links the flash kernel to Bank
0
//!
                      (0x80000 - 0x82007 will be reserved). Uses Flash API
symbols
```

```
//!
                        in flash.
//!
//!
            BANKO LDFU ROM: Only supports the Live Device Firmware Update (LDFU)
                            command for Bank 0; other commands are not supported
//!
                            by this build configuration. For more information
//!
about
//!
                            the LDFU command functionality, please read the
documentation
//!
                            in 'flashapi_ex2_LDFU.c'. Links the flash kernel to
Bank 0
                             (0x80000 - 0x82007 will be reserved). Uses Flash API
//!
symbols
//!
                            in ROM; Rev A of F28004x cannot be used with this
build
//!
                            configuration.
//!
            BANKO NO LDFU: Supports all commands except the LDFU command. Links
//!
the
                           flash kernel to Bank 0. Uses Flash API symbols in
//!
flash.
//!
                           Commands must only be used to manipulate flash in
Bank 1.
//!
            BANK1 LDFU: Only supports the Live Device Firmware Update (LDFU)
//!
                        command for Bank 1; other commands are not supported
//!
                        by this build configuration. For more information about
//!
                        the LDFU command functionality, please read the
//!
documentation
//!
                        in 'flashapi ex2 LDFU.c'. Links the flash kernel to Bank
1
//!
                        (0x90000 - 0x92007 will be reserved). Uses Flash API
symbols in
//!
                        flash.
//!
//!
            BANK1 LDFU ROM: Only supports the Live Device Firmware Update (LDFU)
                            command for Bank 1; other commands are not supported
//!
//!
                            by this build configuration. For more information
about
//!
                            the command functionality, please read the
documentation
                            in 'flashapi_ex2_LDFU.c'. Links the flash kernel to
//!
Bank 1.
//!
                             (0x90000 - 0x92007 will be reserved) Uses Flash API
//!
                             symbols in ROM; Rev A of F28004x cannot be used with
this
//!
                            build configuration.
//!
//!
            BANK1_NO_LDFU: Supports all commands except the LDFU command. Links
the
                           flash kernel to Bank 1. Uses Flash API symbols in
//!
flash.
//!
                           Commands must only be used to manipulate flash in
Bank 0.
```

```
//!
//!
           CPU1_RAM: Supports all commands except the LDFU command. Links the
flash
                    kernel to RAM.
//!
//!
//! This example is to be used with the Serial Flash Programmer. Applications
//! flash through commands of the Serial Flash Programmer must be in the '--boot
--sci8
//! --ascii' hex format, which can be achieved by using the hex utility tool.
//!
//! \b External \b Connections \n
//! - Connect SCI Rx and SCI Tx to a COM port of the computer
//!
      running the Serial Flash Programmer project
//!
//! \b Watch \b Variables \n
//! - None
//!
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./CycloneMCU_UpgradeKernel/src/flashapi_ex2_verify.c
flashapi_ex2_verify.c
//
// FILE:
          flashapi ex2 verify.c
//
// TITLE: Verify Source Code
```

```
//
//
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// $
./CycloneMCU UpgradeKernel/src/flashapi ex2 verify.h
flashapi ex2 verify.h
//
// FILE:
         flashapi ex2 verify.h
//
// TITLE: Verify Header
//
// Functions:
//
//
      void verifyData()
// $TI Release: F28004x Support Library v1.06.00.00 $
// $Release Date: Mon May 27 06:42:25 CDT 2019 $
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// $
./Inc/Legacy/stm32 hal legacy.h
stm32_hal_legacy.h
/**
 ********************************
  * @file
            stm32_hal_legacy.h
  * @author MCD Application Team
           This file contains aliases definition for the STM32Cube HAL
  * @brief
constants
            macros and functions maintained for legacy purpose.
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  ************************************
  */
```

```
./Inc/stm32h745xx.h
stm32h745xx.h
 **********************************
 * @file
           stm32h745xx.h
 * @author MCD Application Team
 * @brief
           CMSIS STM32H745xx Device Peripheral Access Layer Header File.
           This file contains:
            - Data structures and the address mapping for all peripherals
            - Peripheral's registers declarations and bits definition
            - Macros to access peripheral's registers hardware
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 ***********************************
 */
./Inc/stm32h7xx.h
stm32h7xx.h
/**
 *******************************
 * @file
           stm32h7xx.h
 * @author MCD Application Team
 * @brief
           CMSIS STM32H7xx Device Peripheral Access Layer Header File.
           The file is the unique include file that the application programmer
           is using in the C source code, usually in main.c. This file
contains:
            - Configuration section that allows to select:
               - The STM32H7xx device used in the target application
               - To use or not the peripheral's drivers in application
code(i.e.
                 code will be based on direct access to peripheral's registers
 *
                 rather than drivers API), this option is controlled by
                 "#define USE_HAL_DRIVER"
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 ***********************************
 */
./Inc/stm32h7xx_hal.h
stm32h7xx_hal.h
/**
 ******************************
 * @file
          stm32h7xx hal.h
 * @author MCD Application Team
 * @brief
          This file contains all the functions prototypes for the HAL
          module driver.
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_adc.h
stm32h7xx_hal_adc.h
 **********************************
 * @file
          stm32h7xx hal adc.h
 * @author MCD Application Team
 * @brief
          Header file of ADC HAL module.
 ************************************
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 */
./Inc/stm32h7xx hal adc ex.h
stm32h7xx_hal_adc_ex.h
/**
 ***********************************
```

```
* @file
           stm32h7xx_hal_adc_ex.h
 * @author MCD Application Team
 * @brief
           Header file of ADC HAL extended module.
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_cec.h
stm32h7xx_hal_cec.h
/**
 ***********************************
 * @file
           stm32h7xx hal cec.h
 * @author MCD Application Team
           Header file of CEC HAL module.
 * @brief
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 ***********************************
 */
./Inc/stm32h7xx hal comp.h
stm32h7xx_hal_comp.h
/**
 **********************************
 * @file
           stm32h7xx hal comp.h
 * @author MCD Application Team
           Header file of COMP HAL module.
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 ********************************
 */
./Inc/stm32h7xx hal conf.h
stm32h7xx_hal_conf.h
/**
 **********************************
          stm32h7xx hal conf.h
 * @author MCD Application Team
   @brief
         HAL configuration file.
 ***********************************
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 **********************************
 */
./Inc/stm32h7xx hal cortex.h
stm32h7xx_hal_cortex.h
/**
 ************************
          stm32h7xx_hal_cortex.h
 * @author MCD Application Team
          Header file of CORTEX HAL module.
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 *******************************
 */
./Inc/stm32h7xx_hal_crc.h
stm32h7xx_hal_crc.h
/**
 ***********************************
          stm32h7xx hal crc.h
 * @author MCD Application Team
         Header file of CRC HAL module.
 * @brief
```

```
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 ***********************************
 */
./Inc/stm32h7xx_hal_crc_ex.h
stm32h7xx_hal_crc_ex.h
/**
 ***********************
 * @file
          stm32h7xx_hal_crc_ex.h
 * @author MCD Application Team
 * @brief
          Header file of CRC HAL extended module.
 ********************
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 **********************************
 */
./Inc/stm32h7xx hal cryp.h
stm32h7xx_hal_cryp.h
/**
 **************************
 * @file
          stm32h7xx_hal_cryp.h
 * @author MCD Application Team
 * @brief
          Header file of CRYP HAL module.
 ***********************************
   @attention
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 ********************************
```

```
*/
./Inc/stm32h7xx_hal_cryp_ex.h
stm32h7xx hal cryp ex.h
/**
 **********************************
          stm32h7xx_hal_cryp_ex.h
 * @author
         MCD Application Team
 * @brief
         Header file of CRYP HAL Extension module.
 @attention
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 ***********************************
 */
./Inc/stm32h7xx hal dac.h
stm32h7xx_hal_dac.h
/**
 **********************************
 * @file
          stm32h7xx hal dac.h
 * @author MCD Application Team
         Header file of DAC HAL module.
 * @brief
 ***********************************
  @attention
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 *******************************
./Inc/stm32h7xx hal dac ex.h
stm32h7xx_hal_dac_ex.h
/**
 *********************************
 * @file
         stm32h7xx_hal_dac_ex.h
 * @author MCD Application Team
 * @brief
         Header file of DAC HAL Extended module.
 * @attention
```

```
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 **********************************
./Inc/stm32h7xx hal dcmi.h
stm32h7xx_hal_dcmi.h
 **********************************
 * @file
          stm32h7xx_hal_dcmi.h
 * @author MCD Application Team
 * @brief
          Header file of DCMI HAL module.
       *************************
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 ***********************************
./Inc/stm32h7xx hal def.h
stm32h7xx_hal_def.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_def.h
 * @author
          MCD Application Team
  @brief
          This file contains HAL common defines, enumeration, macros and
          structures definitions.
 ***********************************
 * @attention
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 ***********************************
 */
```

```
./Inc/stm32h7xx_hal_dfsdm.h
stm32h7xx_hal_dfsdm.h
/**
 ***********************
          stm32h7xx hal dfsdm.h
 * @author MCD Application Team
 * @brief
          Header file of DFSDM HAL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal dfsdm ex.h
stm32h7xx_hal_dfsdm_ex.h
/**
 *****************************
 * @file
          stm32h7xx_hal_dfsdm_ex.h
 * @author MCD Application Team
 * @brief
          Header file of DFSDM HAL extended module.
 @attention
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 ***********************************
 */
./Inc/stm32h7xx hal dma.h
stm32h7xx hal dma.h
/**
 **********************************
 * @file
          stm32h7xx_hal_dma.h
 * @author MCD Application Team
 * @brief
          Header file of DMA HAL module.
 ********************************
   @attention
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 *******************************
 */
./Inc/stm32h7xx hal dma2d.h
stm32h7xx hal dma2d.h
/**
 ***********************************
          stm32h7xx_hal_dma2d.h
 * @author MCD Application Team
 * @brief
          Header file of DMA2D HAL module.
 ************************************
   @attention
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 ***********************************
./Inc/stm32h7xx_hal_dma_ex.h
stm32h7xx_hal_dma_ex.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_dma_ex.h
 * @author MCD Application Team
 * @brief
          Header file of DMA HAL extension module.
 ***********************************
   @attention
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 **********************************
./Inc/stm32h7xx hal dsi.h
stm32h7xx_hal_dsi.h
/**
```

```
* @file
          stm32h7xx_hal_dsi.h
 * @author
          MCD Application Team
  @brief
          Header file of DSI HAL module.
       @attention
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 ***********************************
./Inc/stm32h7xx_hal_dts.h
stm32h7xx_hal_dts.h
/**
 *********************************
 * @file
          stm32h7xx_hal_dts.h
 * @author MCD Application Team
  @brief
          Header file of DTS HAL module.
      @attention
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 */
./Inc/stm32h7xx_hal eth.h
stm32h7xx_hal_eth.h
/**
 *********************************
 * @file
          stm32h7xx hal eth.h
 * @author MCD Application Team
          Header file of ETH HAL module.
  @brief
 ***********************************
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```

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 **********************************
 */
./Inc/stm32h7xx_hal_eth_ex.h
stm32h7xx_hal_eth_ex.h
 ******************************
 * @file
          stm32h7xx hal eth ex.h
  @author MCD Application Team
          Header file of ETH HAL Extended module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx hal exti.h
stm32h7xx hal exti.h
/**
 *******************************
 * @file
          stm32h7xx_hal_exti.h
  @author MCD Application Team
          Header file of EXTI HAL module.
 ***********************************
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 **********************************
 */
./Inc/stm32h7xx_hal_fdcan.h
stm32h7xx hal fdcan.h
 ***********************************
 * @file
          stm32h7xx hal fdcan.h
 * @author MCD Application Team
```

```
* @brief
          Header file of FDCAN HAL module.
 ************************************
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 ***********************************
 */
./Inc/stm32h7xx hal flash.h
stm32h7xx hal flash.h
 ***********************************
 * @file
           stm32h7xx_hal_flash.h
 * @author MCD Application Team
          Header file of FLASH HAL module.
 * @brief
 **********************************
   @attention
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 ***********************************
 */
./Inc/stm32h7xx_hal_flash_ex.h
stm32h7xx hal flash ex.h
/**
 **********************************
 * @file
           stm32H7xx_hal_flash_ex.h
 * @author
          MCD Application Team
 * @brief
          Header file of FLASH HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal gfxmmu.h
stm32h7xx hal gfxmmu.h
/**
 **********************************
 * @file
          stm32h7xx_hal_gfxmmu.h
 * @author MCD Application Team
         Header file of GFXMMU HAL module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_hal_gpio.h
stm32h7xx_hal_gpio.h
/**
 ***********************************
 * @file
          stm32h7xx hal gpio.h
 * @author MCD Application Team
          Header file of GPIO HAL module.
 * @brief
   @attention
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 */
./Inc/stm32h7xx_hal_gpio_ex.h
stm32h7xx_hal_gpio_ex.h
/**
 ******************************
 * @file
          stm32h7xx hal gpio ex.h
 * @author MCD Application Team
 * @brief Header file of GPIO HAL Extension module.
 * @attention
```

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 **********************************
 */
./Inc/stm32h7xx hal hash.h
stm32h7xx_hal_hash.h
/**
 **********************************
          stm32h7xx hal hash.h
 * @author MCD Application Team
 * @brief
          Header file of HASH HAL module.
 ***********************************
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 **********************************
 */
./Inc/stm32h7xx hal hash ex.h
stm32h7xx_hal_hash ex.h
/**
 **********************************
          stm32h7xx hal hash ex.h
 * @author MCD Application Team
          Header file of HASH HAL module.
 ***********************************
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_hcd.h
stm32h7xx_hal_hcd.h
/**
 ****************************
          stm32h7xx hal hcd.h
 * @author MCD Application Team
 * @brief
          Header file of HCD HAL module.
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 ***********************************
 */
./Inc/stm32h7xx hal hrtim.h
stm32h7xx_hal_hrtim.h
/**
 *****************************
 * @file
          stm32h7xx_hal_hrtim.h
 * @author MCD Application Team
 * @brief
          Header file of HRTIM HAL module.
 ********************************
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 *************************************
 */
./Inc/stm32h7xx hal hsem.h
stm32h7xx hal hsem.h
/**
 **********************************
 * @file
          stm32h7xx_hal_hsem.h
 * @author MCD Application Team
 * @brief
          Header file of HSEM HAL module.
 *********************************
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 *******************************
 */
./Inc/stm32h7xx hal i2c.h
stm32h7xx hal i2c.h
/**
 ***********************************
          stm32h7xx_hal_i2c.h
 * @author MCD Application Team
 * @brief
          Header file of I2C HAL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_hal_i2c_ex.h
stm32h7xx_hal_i2c_ex.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_i2c_ex.h
 * @author MCD Application Team
 * @brief
          Header file of I2C HAL Extended module.
 ***********************************
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 *********************************
./Inc/stm32h7xx hal i2s.h
stm32h7xx_hal_i2s.h
/**
```

```
* @file
          stm32h7xx_hal_i2s.h
 * @author
          MCD Application Team
   @brief
          Header file of I2S HAL module.
       ****************************
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 ***********************************
./Inc/stm32h7xx_hal_i2s_ex.h
stm32h7xx_hal_i2s_ex.h
/**
 *********************************
 * @file
          stm32h7xx_hal_i2s_ex.h
 * @author
          MCD Application Team
  @brief
          Header file of I2S HAL module.
       @attention
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 */
./Inc/stm32h7xx_hal_irda.h
stm32h7xx_hal_irda.h
/**
 ********************************
 * @file
          stm32h7xx hal irda.h
 * @author MCD Application Team
          Header file of IRDA HAL module.
   @brief
 ***********************************
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 **********************************
 */
./Inc/stm32h7xx_hal_irda_ex.h
stm32h7xx_hal_irda_ex.h
 ******************************
 * @file
          stm32h7xx hal irda ex.h
  @author MCD Application Team
          Header file of IRDA HAL Extended module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx hal iwdg.h
stm32h7xx hal iwdg.h
/**
 *******************************
 * @file
          stm32h7xx_hal_iwdg.h
  @author MCD Application Team
          Header file of IWDG HAL module.
 ***********************************
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 *******************************
 */
./Inc/stm32h7xx_hal_jpeg.h
stm32h7xx hal jpeg.h
 ***********************************
 * @file
          stm32h7xx_hal_jpeg.h
 * @author MCD Application Team
```

```
* @brief
          Header file of JPEG HAL module.
 ************************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_lptim.h
stm32h7xx hal lptim.h
 ***********************************
 * @file
          stm32h7xx_hal_lptim.h
 * @author MCD Application Team
          Header file of LPTIM HAL module.
 * @brief
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_ltdc.h
stm32h7xx hal ltdc.h
/**
 **********************************
 * @file
          stm32h7xx_hal_ltdc.h
 * @author MCD Application Team
 * @brief
          Header file of LTDC HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal ltdc ex.h
stm32h7xx hal ltdc ex.h
/**
 ***********************************
 * @file
           stm32h7xx_hal_ltdc_ex.h
 * @author MCD Application Team
           Header file of LTDC HAL Extension module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_hal_mdios.h
stm32h7xx_hal_mdios.h
/**
 ***********************************
 * @file
           stm32h7xx hal mdios.h
 * @author MCD Application Team
           Header file of MDIOS HAL module.
 * @brief
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal mdma.h
stm32h7xx_hal_mdma.h
/**
 ******************************
 * @file
           stm32h7xx hal mdma.h
 * @author MCD Application Team
           Header file of DMA HAL module.
 * @attention
```

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 **********************************
 */
./Inc/stm32h7xx hal mmc.h
stm32h7xx_hal_mmc.h
/**
 **********************************
          stm32h7xx hal mmc.h
 * @author MCD Application Team
 * @brief
          Header file of MMC HAL module.
 ************************************
 * @attention
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 **********************************
 */
./Inc/stm32h7xx hal mmc ex.h
stm32h7xx_hal_mmc_ex.h
/**
 *********************************
          stm32h7xx hal mmc ex.h
 * @author MCD Application Team
          Header file of SD HAL extended module.
 ***********************************
 * @attention
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_nand.h
stm32h7xx_hal_nand.h
/**
 ***************************
          stm32h7xx_hal nand.h
 * @author MCD Application Team
 * @brief
          Header file of NAND HAL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal nor.h
stm32h7xx_hal_nor.h
/**
 *****************************
 * @file
          stm32h7xx_hal_nor.h
 * @author MCD Application Team
 * @brief
          Header file of NOR HAL module.
 ********************************
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 ************************************
 */
./Inc/stm32h7xx hal opamp.h
stm32h7xx hal opamp.h
/**
 **********************************
 * @file
          stm32h7xx_hal_opamp.h
 * @author MCD Application Team
 * @brief
          Header file of OPAMP HAL module.
 *********************************
   @attention
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```

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 *******************************
 */
./Inc/stm32h7xx hal opamp ex.h
stm32h7xx hal opamp ex.h
/**
 ************************************
          stm32h7xx_hal_opamp_ex.h
 * @author MCD Application Team
 * @brief
          Header file of OPAMP HAL Extended module.
 ************************************
   @attention
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 ***********************************
./Inc/stm32h7xx_hal_ospi.h
stm32h7xx_hal_ospi.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_ospi.h
 * @author MCD Application Team
 * @brief
          Header file of OSPI HAL module.
 ************************************
   @attention
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 *********************************
./Inc/stm32h7xx hal otfdec.h
stm32h7xx_hal_otfdec.h
/**
```

```
@file
          stm32h7xx_hal_otfdec.h
          MCD Application Team
 * @author
   @brief
          Header file of OTFDEC HAL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx_hal_pcd.h
stm32h7xx_hal_pcd.h
/**
 *********************************
 * @file
          stm32h7xx_hal_pcd.h
 * @author MCD Application Team
   @brief
          Header file of PCD HAL module.
       @attention
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 */
./Inc/stm32h7xx_hal_pcd_ex.h
stm32h7xx_hal_pcd_ex.h
/**
 *********************************
 * @file
          stm32h7xx hal pcd ex.h
 * @author
          MCD Application Team
          Header file of PCD HAL Extension module.
   @brief
 ***********************************
   @attention
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```

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 **********************************
 */
./Inc/stm32h7xx_hal_pssi.h
stm32h7xx_hal_pssi.h
 ******************************
 * @file
          stm32h7xx hal pssi.h
   @author MCD Application Team
          Header file of PSSI HAL module.
 ************************************
   @attention
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 ********************************
 */
./Inc/stm32h7xx hal pwr.h
stm32h7xx hal pwr.h
/**
 *******************************
 * @file
          stm32h7xx_hal_pwr.h
  @author MCD Application Team
          Header file of PWR HAL module.
 ************************************
   @attention
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 *****************************
 */
./Inc/stm32h7xx_hal_pwr_ex.h
stm32h7xx hal pwr ex.h
 ***********************************
 * @file
          stm32h7xx hal pwr ex.h
 * @author MCD Application Team
```

```
* @brief
          Header file of PWR HAL Extension module.
 ***********************************
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 ************************************
 */
./Inc/stm32h7xx_hal_qspi.h
stm32h7xx hal qspi.h
 ***********************************
 * @file
           stm32h7xx_hal_qspi.h
 * @author MCD Application Team
          Header file of OSPI HAL module.
 * @brief
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_ramecc.h
stm32h7xx hal ramecc.h
/**
 ***********************************
 * @file
           stm32h7xx_hal_ramecc.h
 * @author MCD Application Team
 * @brief
          Header file of RAMECC HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal rcc.h
stm32h7xx hal rcc.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_rcc.h
 * @author MCD Application Team
 * @brief Header file of RCC HAL module.
 **********************************
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 */
./Inc/stm32h7xx_hal_rcc_ex.h
stm32h7xx_hal_rcc_ex.h
/**
 ************************
 * @file
           stm32h7xx hal rcc ex.h
 * @author MCD Application Team
           Header file of RCC HAL Extension module.
 * @brief
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 ************************************
 */
./Inc/stm32h7xx hal rng.h
stm32h7xx_hal_rng.h
/**
 *******************************
 * @file
           stm32h7xx hal rng.h
 * @author MCD Application Team
 * @brief Header file of RNG HAL module.
 * @attention
```

```
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 **********************************
 */
./Inc/stm32h7xx hal rng ex.h
stm32h7xx_hal_rng_ex.h
/**
 **********************************
          stm32h7xx hal rng ex.h
 * @author MCD Application Team
          Header file of RNG HAL Extension module.
 ********************************
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 **********************************
 */
./Inc/stm32h7xx hal rtc.h
stm32h7xx_hal_rtc.h
/**
 *********************************
          stm32h7xx hal rtc.h
 * @author MCD Application Team
          Header file of RTC HAL module.
 ***********************************
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_rtc_ex.h
stm32h7xx_hal_rtc_ex.h
/**
 ***********************
          stm32h7xx hal rtc ex.h
 * @author MCD Application Team
 * @brief
          Header file of RTC HAL Extension module.
 ********************************
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 ***********************************
 */
./Inc/stm32h7xx hal sai.h
stm32h7xx_hal_sai.h
/**
 *****************************
 * @file
          stm32h7xx_hal_sai.h
 * @author MCD Application Team
 * @brief
          Header file of SAI HAL module.
 ************************************
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 ************************************
 */
./Inc/stm32h7xx hal sai ex.h
stm32h7xx hal sai ex.h
/**
 ******************************
 * @file
          stm32h7xx_hal_sai_ex.h
 * @author MCD Application Team
 * @brief
          Header file of SAI HAL extended module.
 *********************************
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 *******************************
 */
./Inc/stm32h7xx hal sd.h
stm32h7xx hal sd.h
/**
 ************************************
          stm32h7xx_hal_sd.h
 * @author MCD Application Team
 * @brief
          Header file of SD HAL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_hal_sdram.h
stm32h7xx_hal_sdram.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_sdram.h
 * @author MCD Application Team
 * @brief
          Header file of SDRAM HAL module.
 ************************************
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 *********************************
./Inc/stm32h7xx_hal_sd_ex.h
stm32h7xx_hal_sd_ex.h
/**
```

```
@file
          stm32h7xx_hal_sd_ex.h
          MCD Application Team
 * @author
   @brief
          Header file of SD HAL extended module.
        @attention
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 ***********************************
./Inc/stm32h7xx_hal_smartcard.h
stm32h7xx_hal_smartcard.h
/**
 *********************************
 * @file
          stm32h7xx_hal_smartcard.h
 * @author MCD Application Team
   @brief
          Header file of SMARTCARD HAL module.
       :*************************************
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 */
./Inc/stm32h7xx_hal_smartcard_ex.h
stm32h7xx_hal_smartcard_ex.h
/**
 *********************************
 * @file
          stm32h7xx hal smartcard ex.h
 * @author
          MCD Application Team
          Header file of SMARTCARD HAL Extended module.
   @brief
 ***********************************
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```

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 **********************************
 */
./Inc/stm32h7xx_hal_smbus.h
stm32h7xx_hal_smbus.h
 ******************************
 * @file
          stm32h7xx hal smbus.h
   @author MCD Application Team
          Header file of SMBUS HAL module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx hal spdifrx.h
stm32h7xx hal spdifrx.h
/**
 *******************************
 * @file
          stm32h7xx_hal_spdifrx.h
   @author MCD Application Team
          Header file of SPDIFRX HAL module.
 ***********************************
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 *******************************
 */
./Inc/stm32h7xx_hal_spi.h
stm32h7xx hal spi.h
 ***********************************
 * @file
          stm32h7xx hal spi.h
 * @author MCD Application Team
```

```
* @brief
          Header file of SPI HAL module.
 ***********************************
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 ************************************
 */
./Inc/stm32h7xx_hal_spi_ex.h
stm32h7xx hal spi ex.h
 ***********************************
 * @file
           stm32h7xx_hal_spi_ex.h
 * @author MCD Application Team
          Header file of SPI HAL Extended module.
 * @brief
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_sram.h
stm32h7xx hal sram.h
/**
 ***********************************
 * @file
           stm32h7xx_hal_sram.h
 * @author MCD Application Team
 * @brief
          Header file of SRAM HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal swpmi.h
stm32h7xx hal swpmi.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_swpmi.h
 * @author MCD Application Team
         Header file of SWPMI HAL module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_hal_tim.h
stm32h7xx_hal_tim.h
/**
 ***********************************
 * @file
          stm32h7xx hal tim.h
 * @author MCD Application Team
          Header file of TIM HAL module.
 * @brief
   @attention
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 */
./Inc/stm32h7xx hal tim ex.h
stm32h7xx_hal_tim_ex.h
/**
 ******************************
 * @file
          stm32h7xx hal tim ex.h
 * @author MCD Application Team
          Header file of TIM HAL Extended module.
 * @attention
```

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 **********************************
 */
./Inc/stm32h7xx hal uart.h
stm32h7xx_hal_uart.h
/**
 **********************************
          stm32h7xx hal uart.h
 * @author MCD Application Team
 * @brief
          Header file of UART HAL module.
 ************************************
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 **********************************
 */
./Inc/stm32h7xx hal uart ex.h
stm32h7xx_hal_uart ex.h
/**
 *********************************
          stm32h7xx hal uart ex.h
 * @author MCD Application Team
          Header file of UART HAL Extended module.
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_usart.h
stm32h7xx_hal_usart.h
/**
 ***********************
          stm32h7xx hal usart.h
 * @author MCD Application Team
 * @brief
          Header file of USART HAL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal usart ex.h
stm32h7xx_hal_usart_ex.h
/**
 *****************************
 * @file
          stm32h7xx_hal_usart_ex.h
 * @author MCD Application Team
 * @brief
          Header file of USART HAL Extended module.
 ************************************
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 ************************************
 */
./Inc/stm32h7xx hal wwdg.h
stm32h7xx hal wwdg.h
/**
 ********************************
 * @file
          stm32h7xx_hal_wwdg.h
 * @author MCD Application Team
 * @brief
          Header file of WWDG HAL module.
 *********************************
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 *******************************
 */
./Inc/stm32h7xx ll adc.h
stm32h7xx ll adc.h
/**
 ************************************
 * @file
          stm32h7xx ll adc.h
 * @author MCD Application Team
 * @brief
          Header file of ADC LL module.
 ************************************
   @attention
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 ***********************************
./Inc/stm32h7xx_ll_bdma.h
stm32h7xx_ll_bdma.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_bdma.h
 * @author MCD Application Team
 * @brief
          Header file of BDMA LL module.
 ************************************
   @attention
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 *********************************
./Inc/stm32h7xx ll bus.h
stm32h7xx_ll_bus.h
/**
```

```
* @file
           stm32h7xx_ll_bus.h
 * @author
           MCD Application Team
 * @version $VERSION$
 * @date
           $DATE$
 * @brief
           Header file of BUS LL module.
./Inc/stm32h7xx_ll_comp.h
stm32h7xx_ll_comp.h
/**
 ******************************
 * @file
           stm32h7xx_ll_comp.h
 * @author MCD Application Team
 * @brief
           Header file of COMP LL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx ll cortex.h
stm32h7xx_ll_cortex.h
/**
 ****************************
 * @file
           stm32h7xx ll cortex.h
 * @author MCD Application Team
           Header file of CORTEX LL module.
 * @brief
./Inc/stm32h7xx_ll_crc.h
stm32h7xx ll crc.h
/**
 **********************************
 * @file
           stm32h7xx_ll_crc.h
 * @author
           MCD Application Team
 * @brief
           Header file of CRC LL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx ll crs.h
stm32h7xx ll crs.h
/**
 **********************************
 * @file
          stm32h7xx_ll_crs.h
 * @author MCD Application Team
          Header file of CRS LL module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_ll_dac.h
stm32h7xx_ll_dac.h
/**
 *************************
 * @file
          stm32h7xx ll dac.h
 * @author MCD Application Team
          Header file of DAC LL module.
 * @brief
   @attention
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 */
./Inc/stm32h7xx_ll_delayblock.h
stm32h7xx_ll_delayblock.h
/**
 ******************************
 * @file
          stm32h7xx ll delayblock.h
 * @author MCD Application Team
 * @brief Header file of Delay Block module.
 * @attention
```

```
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 **********************************
 */
./Inc/stm32h7xx ll dma.h
stm32h7xx_ll_dma.h
/**
 **********************************
          stm32h7xx ll dma.h
 * @author MCD Application Team
 * @brief
          Header file of DMA LL module.
 ************************************
 * @attention
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 **********************************
 */
./Inc/stm32h7xx ll dma2d.h
stm32h7xx_ll_dma2d.h
/**
 *********************************
          stm32h7xx ll dma2d.h
 * @author MCD Application Team
          Header file of DMA2D LL module.
 ***********************************
 * @attention
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 ************************************
 */
```

```
./Inc/stm32h7xx_ll_dmamux.h
stm32h7xx_11_dmamux.h
/**
 ***********************
          stm32h7xx 11 dmamux.h
 * @author MCD Application Team
 * @brief
          Header file of DMAMUX LL module.
 ********************************
   @attention
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 ***********************************
 */
./Inc/stm32h7xx ll exti.h
stm32h7xx_ll_exti.h
/**
 *****************************
 * @file
          stm32h7xx_ll_exti.h
 * @author MCD Application Team
 * @brief
          Header file of EXTI LL module.
 ********************************
   @attention
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 ************************************
 */
./Inc/stm32h7xx ll fmc.h
stm32h7xx ll fmc.h
/**
 ******************************
 * @file
          stm32h7xx_11_fmc.h
 * @author MCD Application Team
 * @brief
          Header file of FMC HAL module.
 *********************************
   @attention
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 ***********************************
 */
./Inc/stm32h7xx ll gpio.h
stm32h7xx ll gpio.h
/**
 ************************************
          stm32h7xx_ll_gpio.h
 * @author MCD Application Team
 * @brief
          Header file of GPIO LL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_ll_hrtim.h
stm32h7xx_ll_hrtim.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_hrtim.h
 * @author MCD Application Team
 * @brief
          Header file of HRTIM LL module.
 ************************************
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 *********************************
./Inc/stm32h7xx ll hsem.h
stm32h7xx_ll_hsem.h
/**
```

```
* @file
          stm32h7xx_ll_hsem.h
          MCD Application Team
 * @author
  @brief
          Header file of HSEM LL module.
       ****************************
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 ***********************************
./Inc/stm32h7xx_ll_i2c.h
stm32h7xx_ll_i2c.h
/**
 *********************************
 * @file
          stm32h7xx_ll_i2c.h
 * @author MCD Application Team
  @brief
          Header file of I2C LL module.
       @attention
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 ./Inc/stm32h7xx_ll_iwdg.h
stm32h7xx_ll_iwdg.h
/**
 ************************************
 * @file
          stm32h7xx ll iwdg.h
 * @author
          MCD Application Team
          Header file of IWDG LL module.
  @brief
 ***********************************
  @attention
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```

```
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 **********************************
 */
./Inc/stm32h7xx_ll_lptim.h
stm32h7xx_ll_lptim.h
 ******************************
 * @file
          stm32h7xx ll lptim.h
   @author MCD Application Team
          Header file of LPTIM LL module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx ll lpuart.h
stm32h7xx ll lpuart.h
/**
 *******************************
 * @file
          stm32h7xx_ll_lpuart.h
  @author MCD Application Team
          Header file of LPUART LL module.
 ***********************************
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 ******************************
 */
./Inc/stm32h7xx_ll_mdma.h
stm32h7xx ll mdma.h
 ***********************************
 * @file
          stm32h7xx ll mdma.h
 * @author MCD Application Team
```

```
* @brief
          Header file of MDMA LL module.
 ************************************
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 ************************************
 */
./Inc/stm32h7xx ll opamp.h
stm32h7xx 11 opamp.h
 ***********************************
 * @file
          stm32h7xx_ll_opamp.h
 * @author MCD Application Team
          Header file of OPAMP LL module.
 * @brief
 **********************************
   @attention
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 ***********************************
 */
./Inc/stm32h7xx_ll_pwr.h
stm32h7xx ll pwr.h
/**
 **********************************
 * @file
          stm32h7xx_ll_pwr.h
 * @author MCD Application Team
 * @brief
          Header file of PWR LL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx ll rcc.h
stm32h7xx ll rcc.h
/**
 **********************************
 * @file
          stm32h7xx_ll_rcc.h
 * @author MCD Application Team
 * @version $VERSION$
 * @date
          $DATE$
          Header file of RCC LL module.
   @brief
 ********************************
 * @attention
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 **********************************
 */
./Inc/stm32h7xx ll rng.h
stm32h7xx_ll_rng.h
/**
 ***********************************
          stm32h7xx_ll_rng.h
 * @author MCD Application Team
          Header file of RNG LL module.
 ***********************************
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 *******************************
 */
./Inc/stm32h7xx_ll_rtc.h
stm32h7xx_ll_rtc.h
/**
 *********************************
          stm32h7xx ll rtc.h
 * @author MCD Application Team
 * @brief Header file of RTC LL module.
```

```
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 ***********************************
 */
./Inc/stm32h7xx_ll_sdmmc.h
stm32h7xx ll sdmmc.h
/**
 *******************************
 * @file
           stm32h7xx_ll_sdmmc.h
 * @author MCD Application Team
 * @brief
          Header file of SDMMC HAL module.
   @attention
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 **********************************
 */
./Inc/stm32h7xx ll spi.h
stm32h7xx_ll_spi.h
/**
 ****************************
 * @file
          stm32h7xx_ll_spi.h
 * @author MCD Application Team
 * @brief
          Header file of SPI LL module.
 ***********************************
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 **********************************
```

```
*/
./Inc/stm32h7xx ll swpmi.h
stm32h7xx ll swpmi.h
/**
 *********************************
          stm32h7xx_ll_swpmi.h
 * @author MCD Application Team
 * @brief
          Header file of SWPMI LL module.
 @attention
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 ***********************************
 */
./Inc/stm32h7xx_ll_system.h
stm32h7xx_ll_system.h
/**
 **********************************
 * @file
          stm32h7xx ll system.h
 * @author MCD Application Team
 * @brief
          Header file of SYSTEM LL module.
./Inc/stm32h7xx_ll_tim.h
stm32h7xx ll tim.h
/**
 ***********************************
 * @file
          stm32h7xx ll tim.h
 * @author MCD Application Team
          Header file of TIM LL module.
 * @brief
   @attention
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 ***********************************
 */
./Inc/stm32h7xx_ll_usart.h
stm32h7xx_ll_usart.h
```

```
/**
 *********************************
          stm32h7xx ll usart.h
 * @author MCD Application Team
          Header file of USART LL module.
   @brief
 ************************************
 * @attention
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 **********************************
 */
./Inc/stm32h7xx_ll_usb.h
stm32h7xx ll usb.h
/**
 **********************************
          stm32h7xx_l1_usb.h
 * @author MCD Application Team
 * @brief
          Header file of USB Low Layer HAL module.
 **********************************
 * @attention
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 ********************************
 */
./Inc/stm32h7xx_ll_utils.h
stm32h7xx_ll_utils.h
/**
 **********************************
          stm32h7xx ll utils.h
 * @author MCD Application Team
 * @brief
          Header file of UTILS LL module.
./Inc/stm32h7xx_ll_wwdg.h
stm32h7xx ll wwdg.h
/**
 ***********************************
 * @file
          stm32h7xx ll wwdg.h
 * @author MCD Application Team
```

```
* @brief
           Header file of WWDG LL module.
 ***********************************
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 ***********************************
 */
./Inc/stm32_assert_template.h
stm32 assert template.h
 ***********************************
 * @file
           stm32 assert.h
 * @author MCD Application Team
 * @brief
           STM32 assert template file.
           This file should be copied to the application folder and renamed
           to stm32 assert.h.
 **********************************
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 ***********************************
 */
./Inc/system stm32h7xx.h
system stm32h7xx.h
/**
 *********************************
           system stm32h7xx.h
 * @author MCD Application Team
           CMSIS Cortex-Mx Device System Source File for STM32H7xx devices.
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```

```
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 ********************************
 */
./Src/stm32h7xx hal.c
stm32h7xx_hal.c
/**
 ******************************
           stm32h7xx hal.c
 * @author MCD Application Team
   @brief
           HAL module driver.
           This is the common part of the HAL initialization
./Src/stm32h7xx_hal_adc.c
stm32h7xx hal adc.c
 ***********************************
 * @file
           stm32h7xx hal adc.c
   @author
           MCD Application Team
   @brief
           This file provides firmware functions to manage the following
           functionalities of the Analog to Digital Convertor (ADC)
 *
            + Initialization and de-initialization functions
              ++ Initialization and Configuration of ADC
            + Operation functions
              ++ Start, stop, get result of conversions of regular
                 group, using 3 possible modes: polling, interruption or DMA.
            + Control functions
              ++ Channels configuration on regular group
              ++ Analog Watchdog configuration
            + State functions
              ++ ADC state machine management
              ++ Interrupts and flags management
           Other functions (extended functions) are available in file
           "stm32h7xx_hal_adc_ex.c".
./Src/stm32h7xx_hal_adc_ex.c
stm32h7xx_hal_adc_ex.c
/**
 ******************************
   @file
           stm32h7xx hal adc ex.c
   @author
           MCD Application Team
           This file provides firmware functions to manage the following
   @brief
           functionalities of the Analog to Digital Convertor (ADC)
 *
           peripheral:
 *
            + Operation functions
              ++ Start, stop, get result of conversions of ADC group injected,
                 using 2 possible modes: polling, interruption.
              ++ Calibration
                +++ ADC automatic self-calibration
                +++ Calibration factors get or set
```

```
++ Multimode feature when available
 *
            + Control functions
              ++ Channels configuration on ADC group injected
            + State functions
               ++ ADC group injected contexts queue management
            Other functions (generic functions) are available in file
            "stm32h7xx_hal_adc.c".
./Src/stm32h7xx hal cec.c
stm32h7xx_hal_cec.c
/**
 ***********************************
           stm32h7xx hal cec.c
           MCD Application Team
   @author
   @brief
           CEC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the High Definition Multimedia Interface
           Consumer Electronics Control Peripheral (CEC).
            + Initialization and de-initialization function
            + IO operation function
            + Peripheral Control function
 *
./Src/stm32h7xx_hal_comp.c
stm32h7xx hal comp.c
/**
 ***********************************
   @file
           stm32h7xx_hal_comp.c
   @author MCD Application Team
           COMP HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of the COMP peripheral:
 *
            + Initialization and de-initialization functions
            + Start/Stop operation functions in polling mode
            + Start/Stop operation functions in interrupt mode
            + Peripheral control functions
            + Peripheral state functions
./Src/stm32h7xx_hal_cortex.c
stm32h7xx_hal_cortex.c
/**
 **********************************
           stm32h7xx hal cortex.c
 * @author
           MCD Application Team
   @brief
           CORTEX HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the CORTEX:
            + Initialization and de-initialization functions
            + Peripheral Control functions
./Src/stm32h7xx_hal_crc.c
```

```
stm32h7xx_hal_crc.c
 ******************************
   @file
           stm32h7xx hal crc.c
   @author
           MCD Application Team
   @brief
           CRC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Cyclic Redundancy Check (CRC) peripheral:
 *
            + Initialization and de-initialization functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_crc_ex.c
stm32h7xx_hal_crc_ex.c
/**
 *******************************
   @file
           stm32h7xx_hal_crc_ex.c
   @author
           MCD Application Team
 * @brief
           Extended CRC HAL module driver.
           This file provides firmware functions to manage the extended
           functionalities of the CRC peripheral.
./Src/stm32h7xx_hal_cryp.c
stm32h7xx_hal_cryp.c
/**
 **********************************
 * @file
           stm32h7xx hal cryp.c
 * @author
           MCD Application Team
   @brief
           CRYP HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Cryptography (CRYP) peripheral:
            + Initialization and de-initialization functions
            + AES processing functions
            + DES processing functions
 *
            + TDES processing functions
            + DMA callback functions
            + CRYP IRQ handler management
 *
            + Peripheral State functions
./Src/stm32h7xx_hal_cryp_ex.c
stm32h7xx hal cryp ex.c
/**
 ******************************
 * @file
           stm32h7xx_hal_cryp_ex.c
 * @author
           MCD Application Team
 * @brief
           Extended CRYP HAL module driver
           This file provides firmware functions to manage the following
           functionalities of CRYP extension peripheral:
            + Extended AES processing functions
```

```
./Src/stm32h7xx_hal_dac.c
stm32h7xx_hal_dac.c
/**
 ****************************
           stm32h7xx hal dac.c
           MCD Application Team
   @author
 * @brief
           DAC HAL module driver.
          This file provides firmware functions to manage the following
 *
          functionalities of the Digital to Analog Converter (DAC) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal dac ex.c
stm32h7xx_hal_dac_ex.c
/**
 ***********************************
 * @file
           stm32h7xx hal dac ex.c
 * @author
           MCD Application Team
   @brief
           Extended DAC HAL module driver.
           This file provides firmware functions to manage the extended
           functionalities of the DAC peripheral.
 *
./Src/stm32h7xx hal dcmi.c
stm32h7xx_hal_dcmi.c
/**
 *****************************
 * @file
           stm32h7xx hal dcmi.c
 * @author
           MCD Application Team
 * @brief
           DCMI HAL module driver
           This file provides firmware functions to manage the following
 *
           functionalities of the Digital Camera Interface (DCMI) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Error functions
./Src/stm32h7xx hal dfsdm.c
stm32h7xx_hal_dfsdm.c
/**
 **********************************
 * @file
           stm32h7xx_hal_dfsdm.c
 * @author
           MCD Application Team
 * @brief
           This file provides firmware functions to manage the following
           functionalities of the Digital Filter for Sigma-Delta Modulators
           (DFSDM) peripherals:
            + Initialization and configuration of channels and filters
            + Regular channels configuration
```

```
+ Injected channels configuration
 *
            + Regular/Injected Channels DMA Configuration
            + Interrupts and flags management
            + Analog watchdog feature
            + Short-circuit detector feature
            + Extremes detector feature
            + Clock absence detector feature
            + Break generation on analog watchdog or short-circuit event
./Src/stm32h7xx hal dfsdm ex.c
stm32h7xx_hal_dfsdm_ex.c
 ***********************************
 * @file
           stm32h7xx_hal_dfsdm_ex.c
 * @author MCD Application Team
   @brief
           DFSDM Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionality of the DFSDM Peripheral Controller:
            + Set and get pulses skipping on channel.
 **********************************
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                       opensource.org/licenses/BSD-3-Clause
 **********************************
 */
./Src/stm32h7xx hal dma.c
stm32h7xx_hal_dma.c
/**
 *****************************
 * @file
           stm32h7xx hal dma.c
 * @author
           MCD Application Team
 * @brief
           DMA HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Direct Memory Access (DMA) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and errors functions
./Src/stm32h7xx_hal_dma2d.c
stm32h7xx_hal_dma2d.c
/**
 ***********************************
 * @file
           stm32h7xx hal dma2d.c
 * @author MCD Application Team
```

```
DMA2D HAL module driver.
   @brief
            This file provides firmware functions to manage the following
 *
            functionalities of the DMA2D peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal dma ex.c
stm32h7xx_hal_dma_ex.c
/**
 ***********************************
            stm32h7xx hal dma ex.c
           MCD Application Team
 * @author
   @brief
           DMA Extension HAL module driver
           This file provides firmware functions to manage the following
            functionalities of the DMA Extension peripheral:
            + Extended features functions
./Src/stm32h7xx hal dsi.c
stm32h7xx_hal_dsi.c
/**
 *****************************
 * @file
            stm32h7xx_hal_dsi.c
 * @author
           MCD Application Team
 * @brief
           DSI HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the DSI peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal dts.c
stm32h7xx_hal_dts.c
/**
 ******************************
 * @file
            stm32h7xx hal dts.c
 * @author
           MCD Application Team
 * @brief
           DTS HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the DTS peripheral:
            + Initialization and de-initialization functions
            + Start/Stop operation functions in polling mode.
            + Start/Stop operation functions in interrupt mode.
            + Peripheral Control functions
 *
            + Peripheral State functions
./Src/stm32h7xx hal eth.c
stm32h7xx_hal_eth.c
/**
```

```
@file
           stm32h7xx_hal_eth.c
   @author
           MCD Application Team
   @brief
           ETH HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Ethernet (ETH) peripheral:
            + Initialization and deinitialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_eth_ex.c
stm32h7xx_hal_eth_ex.c
/**
 **********************************
           stm32h7xx hal eth ex.c
 * @author MCD Application Team
   @brief
           ETH HAL Extended module driver.
 ***********************************
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                       opensource.org/licenses/BSD-3-Clause
 *****************************
 */
./Src/stm32h7xx hal exti.c
stm32h7xx hal exti.c
/**
 ******************************
 * @file
           stm32h7xx hal exti.c
 * @author MCD Application Team
 * @brief
           EXTI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the General Purpose Input/Output (EXTI)
peripheral:
            + Initialization and de-initialization functions
 *
            + IO operation functions
./Src/stm32h7xx_hal_fdcan.c
stm32h7xx hal fdcan.c
/**
 ***********************************
 * @file
           stm32h7xx hal fdcan.c
 * @author MCD Application Team
```

```
FDCAN HAL module driver.
   @brief
            This file provides firmware functions to manage the following
 *
            functionalities of the Flexible DataRate Controller Area Network
            (FDCAN) peripheral:
             + Initialization and de-initialization functions
            + IO operation functions
             + Peripheral Configuration and Control functions
             + Peripheral State and Error functions
./Src/stm32h7xx hal flash.c
stm32h7xx_hal_flash.c
/**
 ***********************************
 * @file
            stm32h7xx_hal_flash.c
 * @author MCD Application Team
   @brief
           FLASH HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the internal FLASH memory:
            + Program operations functions
            + Memory Control functions
             + Peripheral Errors functions
./Src/stm32h7xx_hal_flash_ex.c
stm32h7xx_hal_flash_ex.c
/**
 ***********************************
 * @file
            stm32h7xx hal flash ex.c
 * @author MCD Application Team
 * @brief
           Extended FLASH HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the FLASH extension peripheral:
             + Extended programming operations functions
./Src/stm32h7xx_hal_gfxmmu.c
stm32h7xx hal gfxmmu.c
/**
 **********************************
 * @file
            stm32h7xx_hal_gfxmmu.c
 * @author MCD Application Team
 * @brief
           This file provides firmware functions to manage the following
            functionalities of the Graphic MMU (GFXMMU) peripheral:
 *
            + Initialization and De-initialization.
             + LUT configuration.
            + Force flush and/or invalidate of cache.
            + Modify physical buffer adresses.
             + Modify cache and pre-fetch parameters.
             + Error management.
./Src/stm32h7xx_hal_gpio.c
stm32h7xx_hal_gpio.c
```

```
/**
 ********************************
 * @file
           stm32h7xx_hal_gpio.c
 * @author MCD Application Team
           GPIO HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of the General Purpose Input/Output (GPIO)
peripheral:
            + Initialization and de-initialization functions
 *
            + IO operation functions
./Src/stm32h7xx hal hash.c
stm32h7xx_hal_hash.c
/**
 **********************************
           stm32h7xx hal hash.c
   @author MCD Application Team
   @brief
           HASH HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the HASH peripheral:
            + Initialization and de-initialization methods
            + HASH or HMAC processing in polling mode
            + HASH or HMAC processing in interrupt mode
            + HASH or HMAC processing in DMA mode
            + Peripheral State methods
            + HASH or HMAC processing suspension/resumption
./Src/stm32h7xx_hal_hash_ex.c
stm32h7xx_hal_hash_ex.c
 **********************************
 * @file
           stm32h7xx hal hash ex.c
 * @author
           MCD Application Team
   @brief
           Extended HASH HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the HASH peripheral for SHA-224 and SHA-256
           alogrithms:
            + HASH or HMAC processing in polling mode
            + HASH or HMAC processing in interrupt mode
            + HASH or HMAC processing in DMA mode
          Additionally, this file provides functions to manage HMAC
          multi-buffer DMA-based processing for MD-5, SHA-1, SHA-224
           and SHA-256.
./Src/stm32h7xx_hal_hcd.c
stm32h7xx hal hcd.c
 ***********************************
 * @file
           stm32h7xx hal hcd.c
 * @author MCD Application Team
```

```
HCD HAL module driver.
   @brief
            This file provides firmware functions to manage the following
 *
            functionalities of the USB Peripheral Controller:
             + Initialization and de-initialization functions
             + IO operation functions
             + Peripheral Control functions
             + Peripheral State functions
./Src/stm32h7xx hal hrtim.c
stm32h7xx_hal_hrtim.c
/**
 ************************************
            stm32h7xx hal hrtim.c
            MCD Application Team
   @author
   @brief
            TIM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the High Resolution Timer (HRTIM) peripheral:
             + HRTIM Initialization
             + Timer Time Base Unit Configuration
             + Simple Time Base Start/Stop
             + Simple Time Base Start/Stop Interrupt
             + Simple Time Base Start/Stop DMA Request
             + Simple Output Compare/PWM Channel Configuration
             + Simple Output Compare/PWM Channel Start/Stop Interrupt
             + Simple Output Compare/PWM Channel Start/Stop DMA Request
             + Simple Input Capture Channel Configuration
             + Simple Input Capture Channel Start/Stop Interrupt
             + Simple Input Capture Channel Start/Stop DMA Request
             + Simple One Pulse Channel Configuration
             + Simple One Pulse Channel Start/Stop Interrupt
             + HRTIM External Synchronization Configuration
             + HRTIM Burst Mode Controller Configuration
             + HRTIM Burst Mode Controller Enabling
             + HRTIM External Events Conditioning Configuration
             + HRTIM Faults Conditioning Configuration
             + HRTIM Faults Enabling
             + HRTIM ADC trigger Configuration
             + Waveform Timer Configuration
             + Waveform Event Filtering Configuration
             + Waveform Dead Time Insertion Configuration
             + Waveform Chopper Mode Configuration
             + Waveform Compare Unit Configuration
             + Waveform Capture Unit Configuration
             + Waveform Output Configuration
             + Waveform Counter Start/Stop
             + Waveform Counter Start/Stop Interrupt
             + Waveform Counter Start/Stop DMA Request
             + Waveform Output Enabling
             + Waveform Output Level Set/Get
             + Waveform Output State Get
             + Waveform Burst DMA Operation Configuration
             + Waveform Burst DMA Operation Start
             + Waveform Timer Counter Software Reset
```

```
+ Waveform Capture Software Trigger
             + Waveform Burst Mode Controller Software Trigger
            + Waveform Timer Pre-loadable Registers Update Enabling
             + Waveform Timer Pre-loadable Registers Software Update
             + Waveform Timer Delayed Protection Status Get
             + Waveform Timer Burst Status Get
             + Waveform Timer Push-Pull Status Get
             + Peripheral State Get
./Src/stm32h7xx hal hsem.c
stm32h7xx_hal_hsem.c
/**
 ***********************************
            stm32h7xx hal hsem.c
           MCD Application Team
   @author
   @brief
           HSEM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the semaphore peripheral:
             + Semaphore Take function (2-Step Procedure) , non blocking
             + Semaphore FastTake function (1-Step Procedure) , non blocking
             + Semaphore Status check
             + Semaphore Clear Key Set and Get
             + Release and release all functions
             + Semaphore notification enabling and disabling and callnack
functions
            + IRQ handler management
./Src/stm32h7xx_hal_i2c.c
stm32h7xx_hal_i2c.c
 **********************************
 * @file
            stm32h7xx hal i2c.c
 * @author MCD Application Team
   @brief
            I2C HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Inter Integrated Circuit (I2C) peripheral:
             + Initialization and de-initialization functions
             + IO operation functions
             + Peripheral State and Errors functions
./Src/stm32h7xx hal i2c ex.c
stm32h7xx hal i2c ex.c
 **********************************
 * @file
            stm32h7xx_hal_i2c_ex.c
 * @author MCD Application Team
 * @brief
            I2C Extended HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of I2C Extended peripheral:
             + Extended features functions
```

```
./Src/stm32h7xx_hal_i2s.c
stm32h7xx hal i2s.c
 **********************************
 * @file
           stm32h7xx hal i2s.c
 * @author
           MCD Application Team
   @brief
           I2S HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Integrated Interchip Sound (I2S) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_i2s_ex.c
stm32h7xx_hal_i2s_ex.c
/**
 ******************************
 * @file
           stm32h7xx_hal_i2s_ex.c
 * @author
           MCD Application Team
 * @brief
           I2S HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of I2S extension peripheral:
 *
            + Extension features Functions
./Src/stm32h7xx hal irda.c
stm32h7xx_hal_irda.c
/**
 ***********************************
           stm32h7xx_hal_irda.c
 * @author
           MCD Application Team
   @brief
           IRDA HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the IrDA (Infrared Data Association) Peripheral
           (IRDA)
 *
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and Errors functions
 *
            + Peripheral Control functions
./Src/stm32h7xx hal iwdg.c
stm32h7xx hal iwdg.c
/**
 ******************************
 * @file
           stm32h7xx_hal_iwdg.c
 * @author
           MCD Application Team
 * @brief
           IWDG HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Independent Watchdog (IWDG) peripheral:
            + Initialization and Start functions
            + IO operation functions
```

```
./Src/stm32h7xx_hal_jpeg.c
stm32h7xx hal jpeg.c
  ***********************************
  * @file
            stm32h7xx hal jpeg.c
  * @author
            MCD Application Team
   @brief
            JPEG HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the JPEG encoder/decoder peripheral:
             + Initialization and de-initialization functions
             + JPEG processing functions encoding and decoding
             + JPEG decoding Getting Info and encoding configuration setting
             + JPEG enable/disable header parsing functions (for decoding)
             + JPEG Input/Output Buffer configuration.
  *
             + JPEG callback functions
            + JPEG Abort/Pause/Resume functions
            + JPEG custom quantization tables setting functions
             + IRQ handler management
             + Peripheral State and Error functions
./Src/stm32h7xx_hal_lptim.c
stm32h7xx_hal_lptim.c
  **********************************
  * @file
            stm32h7xx hal lptim.c
  * @author
            MCD Application Team
   @brief
            LPTIM HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the Low Power Timer (LPTIM) peripheral:
             + Initialization and de-initialization functions.
             + Start/Stop operation functions in polling mode.
            + Start/Stop operation functions in interrupt mode.
             + Reading operation functions.
             + Peripheral State functions.
./Src/stm32h7xx hal ltdc.c
stm32h7xx_hal_ltdc.c
/**
  **********************************
  * @file
            stm32h7xx hal ltdc.c
   @author
           MCD Application Team
   @brief
            LTDC HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the LTDC peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
             + Peripheral Control functions
  *
             + Peripheral State and Errors functions
./Src/stm32h7xx_hal_ltdc_ex.c
```

```
stm32h7xx_hal_ltdc_ex.c
 ******************************
  @file
          stm32h7xx hal ltdc ex.c
   @author MCD Application Team
          LTDC Extension HAL module driver.
   @brief
 *******************************
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                      opensource.org/licenses/BSD-3-Clause
 ******************************
 */
./Src/stm32h7xx hal mdios.c
stm32h7xx hal mdios.c
/**
 *******************************
  @file
          stm32h7xx_hal_mdios.c
   @author MCD Application Team
   @brief
          MDIOS HAL module driver.
          This file provides firmware functions to manage the following
           functionalities of the MDIOS Peripheral.
 *
           + Initialization and de-initialization functions
           + IO operation functions
           + Peripheral Control functions
 *
./Src/stm32h7xx hal mdma.c
stm32h7xx_hal_mdma.c
/**
 ***************************
 * @file
           stm32h7xx hal mdma.c
 * @author MCD Application Team
 * @brief This file provides firmware functions to manage the following
          functionalities of the Master Direct Memory Access (MDMA)
peripheral:
           + Initialization/de-initialization functions
 *
           + I/O operation functions
           + Peripheral State and errors functions
./Src/stm32h7xx_hal_mmc.c
stm32h7xx hal mmc.c
/**
 ***********************************
 * @file
          stm32h7xx hal mmc.c
 * @author MCD Application Team
```

```
This file provides firmware functions to manage the following
 *
           functionalities of the Secure Digital (MMC) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + MMC card Control functions
./Src/stm32h7xx hal mmc ex.c
stm32h7xx_hal_mmc_ex.c
/**
  ***********************************
           stm32h7xx hal mmc ex.c
           MCD Application Team
  * @author
   @brief
           MMC card Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Secure Digital (MMC) peripheral:
 *
            + Extended features functions
./Src/stm32h7xx hal msp.c
stm32h7xx_hal_msp.c
/**
 ******************************
 * @file
           stm32h7xx_hal_msp_template.c
           MCD Application Team
  * @author
  * @brief
           HAL MSP module.
           This file template is located in the HAL folder and should be
copied
           to the user folder.
./Src/stm32h7xx hal nand.c
stm32h7xx_hal_nand.c
/**
  *********************************
           stm32h7xx hal nand.c
  * @author MCD Application Team
  * @brief
           NAND HAL module driver.
           This file provides a generic firmware to drive NAND memories
mounted
           as external device.
./Src/stm32h7xx hal nor.c
stm32h7xx_hal_nor.c
/**
  **********************************
  * @file
           stm32h7xx hal nor.c
  * @author MCD Application Team
   @brief
           NOR HAL module driver.
           This file provides a generic firmware to drive NOR memories mounted
  *
           as external device.
```

MMC card HAL module driver.

@brief

```
./Src/stm32h7xx hal opamp.c
stm32h7xx hal opamp.c
/**
 *********************************
           stm32h7xx_hal_opamp.c
 * @author
           MCD Application Team
   @brief
           OPAMP HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the operational amplifier(s) peripheral:
            + OPAMP configuration
            + OPAMP calibration
           Thanks to
            + Initialization and de-initialization functions
 *
            + IO operation functions
 *
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx hal opamp ex.c
stm32h7xx hal opamp ex.c
/**
 *******************************
 * @file
           stm32h7xx_hal_opamp_ex.c
   @author
           MCD Application Team
 * @brief
           Extended OPAMP HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the operational amplifier(s)(OPAMP1, OPAMP2 etc)
           peripheral:
            + Extended Initialization and de-initialization functions
            + Extended Peripheral Control functions
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                        opensource.org/licenses/BSD-3-Clause
 ***********************************
 */
./Src/stm32h7xx_hal_ospi.c
stm32h7xx_hal_ospi.c
/**
 ***********************************
           stm32h7xx hal ospi.c
 * @author MCD Application Team
 * @brief
           OSPI HAL module driver.
```

```
./Src/stm32h7xx_hal_otfdec.c
stm32h7xx hal otfdec.c
 ***********************************
 * @file
           stm32h7xx hal otfdec.c
 * @author MCD Application Team
           OTFDEC HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
           functionalities of the On-The-Fly Decryption (OTFDEC) peripheral:
            + Initialization and de-initialization functions
            + Region setting/enable functions
            + Peripheral State functions
./Src/stm32h7xx_hal_pcd.c
stm32h7xx hal pcd.c
 ***********************************
 * @file
           stm32h7xx_hal pcd.c
 * @author MCD Application Team
           PCD HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
 *
           functionalities of the USB Peripheral Controller:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
 *
            + Peripheral State functions
./Src/stm32h7xx_hal_pcd_ex.c
stm32h7xx_hal_pcd_ex.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_pcd_ex.c
 * @author
           MCD Application Team
   @brief
           PCD Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the USB Peripheral Controller:
            + Extended features functions
 *******************************
   @attention
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 ************************************
 */
```

```
./Src/stm32h7xx_hal_pssi.c
stm32h7xx hal pssi.c
 *********************************
 * @file
           stm32h7xx hal pssi.c
 * @author
           MCD Application Team
           PSSI HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
           functionalities of the Parallel Synchronous Slave Interface (PSSI)
peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
 *
            + Peripheral State and Errors functions
./Src/stm32h7xx hal pwr.c
stm32h7xx_hal_pwr.c
/**
 ***********************************
           stm32h7xx hal pwr.c
   @author
           MCD Application Team
   @brief
           PWR HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Power Controller (PWR) peripheral:
 *
            + Initialization and de-initialization functions.
            + Peripheral Control functions.
            + Interrupt Handling functions.
./Src/stm32h7xx_hal_pwr_ex.c
stm32h7xx_hal_pwr_ex.c
 **********************************
 * @file
           stm32h7xx hal pwr ex.c
 * @author
           MCD Application Team
           Extended PWR HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
 *
           functionalities of PWR extension peripheral:
            + Peripheral Extended features functions
./Src/stm32h7xx_hal_qspi.c
stm32h7xx_hal_qspi.c
/**
 *********************************
   @file
           stm32h7xx hal qspi.c
   @author
           MCD Application Team
   @brief
           QSPI HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the QuadSPI interface (QSPI).
            + Initialization and de-initialization functions
            + Indirect functional mode management
            + Memory-mapped functional mode management
            + Auto-polling functional mode management
            + Interrupts and flags management
```

```
+ MDMA channel configuration for indirect functional mode
 *
            + Errors management and abort functionality
./Src/stm32h7xx hal ramecc.c
stm32h7xx_hal_ramecc.c
/**
 **********************************
           stm32h7xx hal ramecc.c
   @author MCD Application Team
   @brief
           RAMECC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the RAM ECC monitoring (RAMECC) peripheral:
            + Initialization and de-initialization functions
            + Monitoring operation functions
            + Error informations functions
            + State and error functions
./Src/stm32h7xx_hal_rcc.c
stm32h7xx_hal_rcc.c
/**
 *********************************
           stm32h7xx hal rcc.c
   @author MCD Application Team
   @brief
           RCC HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Reset and Clock Control (RCC) peripheral:
            + Initialization and de-initialization functions
 *
            + Peripheral Control functions
./Src/stm32h7xx_hal_rcc ex.c
stm32h7xx_hal_rcc_ex.c
/**
 ***********************************
   @file
           stm32h7xx_hal_rcc_ex.c
           MCD Application Team
   @author
           Extended RCC HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities RCC extension peripheral:
            + Extended Peripheral Control functions
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```

```
*/
./Src/stm32h7xx hal rng.c
stm32h7xx hal rng.c
/**
 **********************************
 * @file
           stm32h7xx_hal_rng.c
 * @author MCD Application Team
   @brief
           RNG HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Random Number Generator (RNG) peripheral:
            + Initialization and configuration functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_rng_ex.c
stm32h7xx_hal_rng_ex.c
/**
 ***********************************
 * @file
           stm32h7xx hal rng ex.c
 * @author MCD Application Team
   @brief
           Extended RNG HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Random Number Generator (RNG) peripheral:
            + Lock configuration functions
            + Reset the RNG
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 ***********************************
 */
./Src/stm32h7xx hal rtc.c
stm32h7xx hal rtc.c
/**
 **********************************
 * @file
           stm32h7xx_hal_rtc.c
 * @author MCD Application Team
 * @brief
           RTC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Real-Time Clock (RTC) peripheral:
            + Initialization/de-initialization
            + Calendar (Time and Date) configuration
```

```
+ Alarms (Alarm A and Alarm B) configuration
 *
            + WakeUp Timer configuration
            + TimeStamp configuration
            + Tampers configuration
            + Backup Data Registers configuration
            + RTC Tamper and TimeStamp Pins Selection
            + Interrupts and flags management
./Src/stm32h7xx hal rtc ex.c
stm32h7xx_hal_rtc_ex.c
/**
 ************************************
           stm32h7xx hal rtc ex.c
           MCD Application Team
   @author
   @brief
           Extended RTC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Real Time Clock (RTC) Extended peripheral:
            + RTC Time Stamp functions
            + RTC Tamper functions
            + RTC Wake-up functions
            + Extended Control functions
 *
            + Extended RTC features functions
./Src/stm32h7xx_hal_sai.c
stm32h7xx hal sai.c
/**
 ***********************************
           stm32h7xx_hal_sai.c
   @file
           MCD Application Team
   @author
           SAI HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of the Serial Audio Interface (SAI) peripheral:
            + Initialization/de-initialization functions
            + I/O operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_sai_ex.c
stm32h7xx_hal_sai_ex.c
/**
 *********************************
           stm32h7xx hal sai ex.c
 * @author MCD Application Team
   @brief
           SAI Extended HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionality of the SAI Peripheral Controller:
            + Modify PDM microphone delays.
 ************************************
   @attention
```

```
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 *********************************
./Src/stm32h7xx hal sd.c
stm32h7xx_hal_sd.c
/**
 *********************************
   @file
           stm32h7xx hal sd.c
   @author MCD Application Team
   @brief
           SD card HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Secure Digital (SD) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx hal sdram.c
stm32h7xx_hal_sdram.c
/**
 ******************************
           stm32h7xx_hal_sdram.c
 * @author MCD Application Team
 * @brief
           SDRAM HAL module driver.
           This file provides a generic firmware to drive SDRAM memories
mounted
 *
           as external device.
 *
./Src/stm32h7xx hal sd ex.c
stm32h7xx_hal_sd_ex.c
/**
 *******************************
 * @file
           stm32h7xx hal sd ex.c
 * @author MCD Application Team
   @brief
           SD card Extended HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Secure Digital (SD) peripheral:
 *
            + Extended features functions
./Src/stm32h7xx hal smartcard.c
stm32h7xx hal smartcard.c
/**
 ***********************************
```

```
* @file
            stm32h7xx_hal_smartcard.c
   @author
           MCD Application Team
   @brief
            SMARTCARD HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the SMARTCARD peripheral:
             + Initialization and de-initialization functions
             + IO operation functions
             + Peripheral Control functions
 *
             + Peripheral State and Error functions
./Src/stm32h7xx_hal_smartcard_ex.c
stm32h7xx_hal_smartcard_ex.c
 **********************************
   @file
            stm32h7xx_hal_smartcard_ex.c
   @author MCD Application Team
   @brief
           SMARTCARD HAL module driver.
            This file provides extended firmware functions to manage the
following
            functionalities of the SmartCard.
             + Initialization and de-initialization functions
 *
             + Peripheral Control functions
./Src/stm32h7xx_hal_smbus.c
stm32h7xx hal smbus.c
/**
 ***********************************
   @file
            stm32h7xx_hal_smbus.c
   @author MCD Application Team
           SMBUS HAL module driver.
   @brief
            This file provides firmware functions to manage the following
            functionalities of the System Management Bus (SMBus) peripheral,
 *
            based on I2C principles of operation :
             + Initialization and de-initialization functions
             + IO operation functions
             + Peripheral State and Errors functions
./Src/stm32h7xx_hal_spdifrx.c
stm32h7xx_hal_spdifrx.c
/**
 *********************************
            stm32h7xx hal spdifrx.c
 * @author MCD Application Team
   @brief
           This file provides firmware functions to manage the following
            functionalities of the SPDIFRX audio interface:
 *
             + Initialization and Configuration
 *
             + Data transfers functions
 *
             + DMA transfers management
             + Interrupts and flags management
./Src/stm32h7xx_hal_spi.c
```

```
stm32h7xx_hal_spi.c
 ******************************
 * @file
           stm32h7xx hal spi.c
 * @author MCD Application Team
 * @brief
           SPI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Serial Peripheral Interface (SPI)
peripheral:
           + Initialization and de-initialization functions
           + IO operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_spi_ex.c
stm32h7xx hal spi ex.c
 ***********************************
 * @file
           stm32h7xx_hal_spi_ex.c
 * @author MCD Application Team
           Extended SPI HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
           SPI peripheral extended functionalities :
            + IO operation functions
            + Peripheral Control functions
 ************************************
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 **********************************
 */
./Src/stm32h7xx_hal_sram.c
stm32h7xx hal sram.c
 *******************************
 * @file
           stm32h7xx hal sram.c
 * @author MCD Application Team
 * @brief
           SRAM HAL module driver.
           This file provides a generic firmware to drive SRAM memories
 *
           mounted as external device.
./Src/stm32h7xx hal swpmi.c
stm32h7xx_hal_swpmi.c
```

```
/**
 ********************************
 * @file
           stm32h7xx hal swpmi.c
   @author MCD Application Team
   @brief
           SWPMI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Single Wire Protocol Master Interface
(SWPMI).
            + Initialization and Configuration
 *
            + Data transfers functions
            + DMA transfers management
            + Interrupts and flags management
./Src/stm32h7xx hal tim.c
stm32h7xx_hal_tim.c
/**
 **********************************
   @file
           stm32h7xx_hal_tim.c
   @author
           MCD Application Team
   @brief
           TIM HAL module driver.
           This file provides firmware functions to manage the following
            functionalities of the Timer (TIM) peripheral:
            + TIM Time Base Initialization
            + TIM Time Base Start
             + TIM Time Base Start Interruption
            + TIM Time Base Start DMA
            + TIM Output Compare/PWM Initialization
            + TIM Output Compare/PWM Channel Configuration
            + TIM Output Compare/PWM Start
            + TIM Output Compare/PWM Start Interruption
            + TIM Output Compare/PWM Start DMA
            + TIM Input Capture Initialization
            + TIM Input Capture Channel Configuration
            + TIM Input Capture Start
            + TIM Input Capture Start Interruption
            + TIM Input Capture Start DMA
            + TIM One Pulse Initialization
            + TIM One Pulse Channel Configuration
            + TIM One Pulse Start
            + TIM Encoder Interface Initialization
            + TIM Encoder Interface Start
            + TIM Encoder Interface Start Interruption
            + TIM Encoder Interface Start DMA
            + Commutation Event configuration with Interruption and DMA
            + TIM OCRef clear configuration
            + TIM External Clock configuration
./Src/stm32h7xx_hal_tim_ex.c
stm32h7xx_hal_tim_ex.c
/**
 ***********************************
           stm32h7xx hal tim ex.c
 * @author MCD Application Team
 * @brief
           TIM HAL module driver.
```

```
This file provides firmware functions to manage the following
 *
            functionalities of the Timer Extended peripheral:
             + Time Hall Sensor Interface Initialization
             + Time Hall Sensor Interface Start
             + Time Complementary signal break and dead time configuration
             + Time Master and Slave synchronization configuration
             + Time Output Compare/PWM Channel Configuration (for channels 5
and 6)
 *
             + Timer remapping capabilities configuration
./Src/stm32h7xx hal uart.c
stm32h7xx_hal_uart.c
/**
 ***********************************
 * @file
            stm32h7xx_hal_uart.c
 * @author MCD Application Team
   @brief
           UART HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Universal Asynchronous Receiver Transmitter
Peripheral (UART).
             + Initialization and de-initialization functions
             + IO operation functions
 *
             + Peripheral Control functions
 *
./Src/stm32h7xx hal uart ex.c
stm32h7xx_hal_uart_ex.c
/**
 ************************
            stm32h7xx_hal_uart_ex.c
 * @author MCD Application Team
   @brief
            Extended UART HAL module driver.
            This file provides firmware functions to manage the following
extended
            functionalities of the Universal Asynchronous Receiver Transmitter
Peripheral (UART).
            + Initialization and de-initialization functions
             + Peripheral Control functions
 *
./Src/stm32h7xx hal usart.c
stm32h7xx hal usart.c
/**
 ********************************
 * @file
            stm32h7xx_hal_usart.c
 * @author
           MCD Application Team
 * @brief
           USART HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Universal Synchronous/Asynchronous Receiver
Transmitter
            Peripheral (USART).
 *
             + Initialization and de-initialization functions
```

```
+ IO operation functions
            + Peripheral Control functions
 *
            + Peripheral State and Error functions
./Src/stm32h7xx hal usart ex.c
stm32h7xx_hal_usart_ex.c
/**
 ******************************
           stm32h7xx hal usart ex.c
 * @author MCD Application Team
   @brief
           Extended USART HAL module driver.
           This file provides firmware functions to manage the following
extended
           functionalities of the Universal Synchronous Receiver Transmitter
Peripheral (USART).
           + Peripheral Control functions
 *
./Src/stm32h7xx hal wwdg.c
stm32h7xx hal wwdg.c
/**
 *******************************
 * @file
           stm32h7xx_hal_wwdg.c
   @author MCD Application Team
 * @brief
           WWDG HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Window Watchdog (WWDG) peripheral:
 *
            + Initialization and Configuration functions
            + IO operation functions
./Src/stm32h7xx_ll adc.c
stm32h7xx_ll_adc.c
/**
 ******************************
 * @file
           stm32h7xx_ll_adc.c
 * @author MCD Application Team
           ADC LL module driver
   @brief
 *******************************
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 ***********************************
 */
./Src/stm32h7xx_ll_bdma.c
```

```
stm32h7xx_ll_bdma.c
 ******************************
  @file
          stm32h7xx ll bdma.c
   @author MCD Application Team
          BDMA LL module driver.
  @brief
 ***********************************
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 ********************************
 */
./Src/stm32h7xx_ll_comp.c
stm32h7xx ll comp.c
/**
 *******************************
 * @file
          stm32h7xx_ll_comp.c
  @author MCD Application Team
 * @brief
          COMP LL module driver
 ***********************************
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 *******************************
 */
./Src/stm32h7xx_ll_crc.c
stm32h7xx ll crc.c
/**
 *******************************
 * @file
          stm32h7xx ll crc.c
 * @author MCD Application Team
          CRC LL module driver.
 * @brief
 **********************************
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 ************************************
 */
./Src/stm32h7xx_ll_crs.c
stm32h7xx ll crs.c
 ***********************************
 * @file
          stm32h7xx_ll_crs.h
 * @author MCD Application Team
 * @brief
          CRS LL module driver.
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx_ll_dac.c
stm32h7xx_ll_dac.c
 **********************************
 * @file
          stm32h7xx 11 dac.c
 * @author MCD Application Team
          DAC LL module driver
 * @brief
 ************************************
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 */
./Src/stm32h7xx ll delayblock.c
stm32h7xx_ll_delayblock.c
/**
 ***********************************
```

```
* @file
           stm32h7xx_ll_delayblock.c
 * @author
           MCD Application Team
   @brief
           DelayBlock Low Layer HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Delay Block peripheral:
            + input clock frequency range 25MHz to 208MHz
            + up to 12 oversampling phases
./Src/stm32h7xx 11 dma.c
stm32h7xx_ll_dma.c
/**
 ***********************************
 * @file
           stm32h7xx_ll_dma.c
 * @author MCD Application Team
 * @brief DMA LL module driver.
 *************************************
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 ************************************
 */
./Src/stm32h7xx_ll_dma2d.c
stm32h7xx 11 dma2d.c
/**
 ***********************************
 * @file
           stm32h7xx ll dma2d.c
 * @author MCD Application Team
           DMA2D LL module driver.
 * @brief
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 ***********************************
 */
./Src/stm32h7xx_ll_exti.c
stm32h7xx_ll_exti.c
```

```
/**
 ***********************************
           stm32h7xx ll exti.c
  @author MCD Application Team
          EXTI LL module driver.
   @brief
 ************************************
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 ***********************************
 */
./Src/stm32h7xx_ll_fmc.c
stm32h7xx 11 fmc.c
/**
 ***********************************
          stm32h7xx ll fmc.c
 * @author MCD Application Team
   @brief
          FMC Low Layer HAL module driver.
 *
           This file provides firmware functions to manage the following
           functionalities of the Flexible Memory Controller (FMC) peripheral
memories:
 *
           + Initialization/de-initialization functions
           + Peripheral Control functions
 *
           + Peripheral State functions
./Src/stm32h7xx ll gpio.c
stm32h7xx_ll_gpio.c
/**
 ****************************
 * @file
           stm32h7xx_ll_gpio.c
 * @author MCD Application Team
          GPIO LL module driver.
 * @brief
 ************************************
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 **********************************
```

```
*/
./Src/stm32h7xx ll hrtim.c
stm32h7xx ll hrtim.c
/**
 ***********************************
          stm32h7xx_ll_hrtim.c
 * @author MCD Application Team
 * @brief
          HRTIM LL module driver.
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx ll i2c.c
stm32h7xx_ll_i2c.c
/**
 *********************************
 * @file
          stm32h7xx ll i2c.c
 * @author MCD Application Team
 * @brief
          I2C LL module driver.
 ***********************************
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 *******************************
./Src/stm32h7xx ll lptim.c
stm32h7xx_ll_lptim.c
/**
 ***********************************
 * @file
          stm32h7xx_ll_lptim.c
 * @author MCD Application Team
 * @brief
          LPTIM LL module driver.
 ************************************
 * @attention
```

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 *********************************
./Src/stm32h7xx ll lpuart.c
stm32h7xx_ll_lpuart.c
/**
 **********************************
 * @file
          stm32h7xx_ll_lpuart.c
 * @author MCD Application Team
  @brief
          LPUART LL module driver.
       **************************
   @attention
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 *********************************
./Src/stm32h7xx ll mdma.c
stm32h7xx_ll_mdma.c
/**
 ***********************************
 * @file
          stm32h7xx_ll_mdma.c
 * @author MCD Application Team
          MDMA LL module driver.
 * @brief
 ***********************************
   @attention
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 ***********************************
./Src/stm32h7xx_ll_opamp.c
```

```
stm32h7xx_ll_opamp.c
 ******************************
  @file
          stm32h7xx 11 opamp.c
   @author MCD Application Team
  @brief
          OPAMP LL module driver
 ***********************************
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 *******************************
 */
./Src/stm32h7xx_ll_pwr.c
stm32h7xx ll pwr.c
/**
 *******************************
 * @file
          stm32h7xx_ll_pwr.c
  @author MCD Application Team
 * @brief
          PWR LL module driver.
 ***********************************
   @attention
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 *******************************
 */
./Src/stm32h7xx_ll_rcc.c
stm32h7xx ll rcc.c
/**
 *******************************
 * @file
          stm32h7xx ll rcc.c
 * @author
          MCD Application Team
 * @brief
          RCC LL module driver.
 *********************************
   @attention
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```

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 ************************************
 */
./Src/stm32h7xx_ll_rng.c
stm32h7xx ll rng.c
 ***********************************
 * @file
          stm32h7xx_ll_rng.c
 * @author MCD Application Team
 * @brief
          RNG LL module driver.
 ***********************************
  @attention
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 ***********************************
 */
./Src/stm32h7xx_ll_rtc.c
stm32h7xx_ll_rtc.c
 **********************************
 * @file
          stm32h7xx ll rtc.c
 * @author MCD Application Team
          RTC LL module driver.
 * @brief
 ************************************
  @attention
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 */
./Src/stm32h7xx ll sdmmc.c
stm32h7xx_11_sdmmc.c
/**
```

```
* @file
           stm32h7xx_ll_sdmmc.c
   @author
          MCD Application Team
   @brief
           SDMMC Low Layer HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the SDMMC peripheral:
           + Initialization/de-initialization functions
           + I/O operation functions
           + Peripheral Control functions
           + Peripheral State functions
./Src/stm32h7xx_ll_spi.c
stm32h7xx_ll_spi.c
/**
 **********************************
           stm32h7xx ll spi.c
 * @author MCD Application Team
   @brief
          SPI LL module driver.
 *********************************
 * @attention
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 *********************************
 */
./Src/stm32h7xx ll swpmi.c
stm32h7xx_ll_swpmi.c
/**
 ********************************
           stm32h7xx ll swpmi.c
 * @author MCD Application Team
          SWPMI LL module driver.
 **********************************
 * @attention
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 ***********************************
 */
```

```
./Src/stm32h7xx_ll_tim.c
stm32h7xx_ll_tim.c
/**
 **************************
           stm32h7xx ll tim.c
 * @author MCD Application Team
 * @brief
           TIM LL module driver.
   @attention
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 ***********************************
 */
./Src/stm32h7xx ll usart.c
stm32h7xx_ll_usart.c
/**
 *****************************
 * @file
           stm32h7xx_ll_usart.c
 * @author MCD Application Team
 * @brief
           USART LL module driver.
   @attention
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 *************************************
 */
./Src/stm32h7xx 11 usb.c
stm32h7xx ll usb.c
/**
 ******************************
 * @file
           stm32h7xx_ll_usb.c
 * @author
           MCD Application Team
 * @brief
           USB Low Layer HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the USB Peripheral Controller:
            + Initialization/de-initialization functions
            + I/O operation functions
```

```
+ Peripheral Control functions
 *
            + Peripheral State functions
./Src/stm32h7xx ll utils.c
stm32h7xx_ll_utils.c
 **********************************
 * @file
           stm32h7xx_ll_utils.c
 * @author MCD Application Team
 * @brief
          UTILS LL module driver.
       ***************************
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 ***********************************
/* Includes -----*/
./Src/system stm32h7xx.c
system stm32h7xx.c
/**
 ******************************
           system_stm32h7xx_dualcore_boot_cm4_cm7.c
 * @author MCD Application Team
   @brief
           CMSIS Cortex-Mx Device Peripheral Access Layer System Source File.
           This provides system initialization template function is case of
 *
           an application using a dual core STM32H7 device where
           Cortex-M7 and Cortex-M4 boot are enabled at the FLASH option bytes
     This file provides two functions and one global variable to be called from
     user application:
        - SystemInit(): This function is called at startup just after reset and
                      before branch to main program. This call is made inside
                      the "startup_stm32h7xx.s" file.
        - SystemCoreClock variable: Contains the core clock, it can be used
                                by the user application to setup the
SysTick
                                timer or configure other parameters.
 *
 *
       - SystemCoreClockUpdate(): Updates the variable SystemCoreClock and
must
                               be called whenever the core clock is changed
 *
                               during program execution.
```

```
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 ***********************************
 */
./Inc/Legacy/stm32_hal_legacy.h
stm32_hal_legacy.h
/**
 *******************************
 * @file
          stm32_hal_legacy.h
 * @author MCD Application Team
 * @brief
          This file contains aliases definition for the STM32Cube HAL
constants
          macros and functions maintained for legacy purpose.
 ***********************************
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 ***********************************
./Inc/stm32h745xx.h
stm32h745xx.h
/**
 ***********************************
 * @file
          stm32h745xx.h
 * @author MCD Application Team
   @brief CMSIS STM32H745xx Device Peripheral Access Layer Header File.
          This file contains:
           - Data structures and the address mapping for all peripherals
           - Peripheral's registers declarations and bits definition
           - Macros to access peripheral's registers hardware
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./Inc/stm32h7xx.h
stm32h7xx.h
 ***********************************
 * @file
           stm32h7xx.h
 * @author MCD Application Team
   @brief
           CMSIS STM32H7xx Device Peripheral Access Layer Header File.
           The file is the unique include file that the application programmer
           is using in the C source code, usually in main.c. This file
contains:
            - Configuration section that allows to select:
 *
               - The STM32H7xx device used in the target application
               - To use or not the peripheral's drivers in application
code(i.e.
                code will be based on direct access to peripheral's registers
                rather than drivers API), this option is controlled by
 *
                "#define USE HAL DRIVER"
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx hal.h
stm32h7xx hal.h
/**
 ***********************************
 * @file
           stm32h7xx_hal.h
 * @author
           MCD Application Team
 * @brief
           This file contains all the functions prototypes for the HAL
           module driver.
 ************************************
 * @attention
```

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 *********************************
./Inc/stm32h7xx_hal_adc.h
stm32h7xx_hal_adc.h
 **********************************
 * @file
          stm32h7xx_hal_adc.h
 * @author MCD Application Team
 * @brief
          Header file of ADC HAL module.
       **********************
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 ************************************
./Inc/stm32h7xx_hal_adc ex.h
stm32h7xx_hal_adc_ex.h
 ***********************************
 * @file
          stm32h7xx_hal_adc_ex.h
 * @author MCD Application Team
          Header file of ADC HAL extended module.
 * @brief
 *******************************
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 *********************************
./Inc/stm32h7xx_hal_cec.h
```

```
stm32h7xx_hal_cec.h
 ******************************
  @file
          stm32h7xx hal cec.h
   @author MCD Application Team
          Header file of CEC HAL module.
   @brief
 ***********************************
   @attention
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 *******************************
 */
./Inc/stm32h7xx hal comp.h
stm32h7xx hal comp.h
/**
 *********************************
 * @file
          stm32h7xx_hal_comp.h
   @author MCD Application Team
          Header file of COMP HAL module.
 * @brief
 ***********************************
   @attention
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 *******************************
 */
./Inc/stm32h7xx_hal_conf.h
stm32h7xx hal conf.h
/**
 ******************************
 * @file
          stm32h7xx hal conf.h
 * @author MCD Application Team
 * @brief
          HAL configuration file.
 ***********************************
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```

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 ************************************
 */
./Inc/stm32h7xx_hal_cortex.h
stm32h7xx hal cortex.h
 ***********************************
 * @file
          stm32h7xx_hal_cortex.h
 * @author MCD Application Team
 * @brief
          Header file of CORTEX HAL module.
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_crc.h
stm32h7xx_hal_crc.h
 **********************************
 * @file
          stm32h7xx hal crc.h
 * @author MCD Application Team
 * @brief
          Header file of CRC HAL module.
 ***********************************
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 */
./Inc/stm32h7xx hal crc ex.h
stm32h7xx_hal_crc_ex.h
/**
 ************************************
```

```
* @file
           stm32h7xx_hal_crc_ex.h
 * @author MCD Application Team
 * @brief
           Header file of CRC HAL extended module.
 **********************************
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 */
./Inc/stm32h7xx_hal_cryp.h
stm32h7xx_hal_cryp.h
/**
 ***********************************
 * @file
           stm32h7xx hal cryp.h
 * @author MCD Application Team
           Header file of CRYP HAL module.
 * @brief
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 ***********************************
 */
./Inc/stm32h7xx_hal_cryp_ex.h
stm32h7xx_hal_cryp_ex.h
/**
 ************************
           stm32h7xx hal cryp ex.h
 * @author MCD Application Team
           Header file of CRYP HAL Extension module.
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```

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 *********************************
 */
./Inc/stm32h7xx hal dac.h
stm32h7xx_hal_dac.h
/**
 **********************************
          stm32h7xx hal dac.h
 * @author MCD Application Team
   @brief
          Header file of DAC HAL module.
 ***********************************
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 *********************************
 */
./Inc/stm32h7xx hal dac ex.h
stm32h7xx_hal_dac_ex.h
/**
 ************************
          stm32h7xx_hal_dac_ex.h
 * @author MCD Application Team
          Header file of DAC HAL Extended module.
 ***********************************
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 *******************************
 */
./Inc/stm32h7xx_hal_dcmi.h
stm32h7xx_hal_dcmi.h
/**
 ***********************************
          stm32h7xx hal dcmi.h
 * @author MCD Application Team
 * @brief Header file of DCMI HAL module.
```

```
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 ***********************************
 */
./Inc/stm32h7xx_hal_def.h
stm32h7xx_hal_def.h
/**
 *******************************
 * @file
           stm32h7xx hal def.h
 * @author MCD Application Team
 * @brief
          This file contains HAL common defines, enumeration, macros and
           structures definitions.
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_dfsdm.h
stm32h7xx hal dfsdm.h
/**
 **********************************
 * @file
           stm32h7xx_hal_dfsdm.h
 * @author MCD Application Team
 * @brief
           Header file of DFSDM HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal dfsdm ex.h
stm32h7xx hal dfsdm ex.h
/**
 **********************************
 * @file
          stm32h7xx_hal_dfsdm_ex.h
 * @author MCD Application Team
          Header file of DFSDM HAL extended module.
 * @brief
 **********************************
   @attention
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 */
./Inc/stm32h7xx_hal_dma.h
stm32h7xx_hal_dma.h
/**
 ***********************************
 * @file
          stm32h7xx hal dma.h
 * @author MCD Application Team
          Header file of DMA HAL module.
 * @brief
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 */
./Inc/stm32h7xx hal dma2d.h
stm32h7xx_hal_dma2d.h
/**
 ******************************
 * @file
          stm32h7xx hal dma2d.h
 * @author MCD Application Team
          Header file of DMA2D HAL module.
 * @attention
```

```
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 **********************************
 */
./Inc/stm32h7xx_hal_dma_ex.h
stm32h7xx_hal_dma_ex.h
/**
 **********************************
          stm32h7xx hal dma ex.h
 * @author MCD Application Team
          Header file of DMA HAL extension module.
 *********************************
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 *********************************
 */
./Inc/stm32h7xx hal dsi.h
stm32h7xx_hal_dsi.h
/**
 **********************************
          stm32h7xx hal dsi.h
 * @author MCD Application Team
          Header file of DSI HAL module.
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_dts.h
stm32h7xx_hal_dts.h
/**
 **************************
          stm32h7xx hal dts.h
 * @author MCD Application Team
 * @brief
          Header file of DTS HAL module.
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal eth.h
stm32h7xx_hal_eth.h
/**
 *****************************
 * @file
          stm32h7xx_hal_eth.h
 * @author MCD Application Team
 * @brief
          Header file of ETH HAL module.
 ********************************
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 *************************************
 */
./Inc/stm32h7xx hal eth ex.h
stm32h7xx hal eth ex.h
/**
 ******************************
 * @file
          stm32h7xx_hal_eth_ex.h
 * @author MCD Application Team
 * @brief
          Header file of ETH HAL Extended module.
 ********************************
   @attention
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```

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 *******************************
 */
./Inc/stm32h7xx hal exti.h
stm32h7xx hal exti.h
/**
 ***********************************
          stm32h7xx_hal_exti.h
 * @author MCD Application Team
 * @brief
          Header file of EXTI HAL module.
 ***********************************
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 ***********************************
./Inc/stm32h7xx hal fdcan.h
stm32h7xx_hal_fdcan.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_fdcan.h
 * @author MCD Application Team
 * @brief
          Header file of FDCAN HAL module.
 ***********************************
   @attention
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 *********************************
./Inc/stm32h7xx hal flash.h
stm32h7xx_hal_flash.h
/**
```

```
@file
          stm32h7xx_hal_flash.h
 * @author
          MCD Application Team
  @brief
          Header file of FLASH HAL module.
       ***************************
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 ***********************************
./Inc/stm32h7xx_hal_flash_ex.h
stm32h7xx_hal_flash_ex.h
/**
 *********************************
 * @file
          stm32H7xx_hal_flash_ex.h
 * @author
          MCD Application Team
  @brief
          Header file of FLASH HAL module.
       @attention
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 ./Inc/stm32h7xx_hal_gfxmmu.h
stm32h7xx_hal_gfxmmu.h
/**
 ********************************
 * @file
          stm32h7xx hal gfxmmu.h
 * @author
          MCD Application Team
          Header file of GFXMMU HAL module.
  @brief
 **********************************
  @attention
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 **********************************
 */
./Inc/stm32h7xx_hal_gpio.h
stm32h7xx_hal_gpio.h
 *******************************
 * @file
          stm32h7xx hal gpio.h
  @author MCD Application Team
          Header file of GPIO HAL module.
 @attention
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 ********************************
 */
./Inc/stm32h7xx hal gpio ex.h
stm32h7xx hal gpio ex.h
/**
 *******************************
 * @file
          stm32h7xx_hal_gpio_ex.h
  @author MCD Application Team
          Header file of GPIO HAL Extension module.
 * @brief
 ***********************************
  @attention
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 **********************************
 */
./Inc/stm32h7xx_hal_hash.h
stm32h7xx hal hash.h
 ***********************************
 * @file
          stm32h7xx hal hash.h
 * @author MCD Application Team
```

```
Header file of HASH HAL module.
 * @brief
 ************************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_hash_ex.h
stm32h7xx hal hash ex.h
 ***********************************
 * @file
          stm32h7xx_hal_hash_ex.h
 * @author MCD Application Team
          Header file of HASH HAL module.
 * @brief
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_hcd.h
stm32h7xx hal hcd.h
/**
 **********************************
 * @file
          stm32h7xx_hal_hcd.h
 * @author MCD Application Team
 * @brief
          Header file of HCD HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal hrtim.h
stm32h7xx hal hrtim.h
/**
 **********************************
 * @file
          stm32h7xx_hal_hrtim.h
 * @author MCD Application Team
         Header file of HRTIM HAL module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_hal_hsem.h
stm32h7xx_hal_hsem.h
/**
 ***********************************
 * @file
          stm32h7xx hal hsem.h
 * @author MCD Application Team
          Header file of HSEM HAL module.
 * @brief
   @attention
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 */
./Inc/stm32h7xx hal i2c.h
stm32h7xx_hal_i2c.h
/**
 ******************************
 * @file
          stm32h7xx hal i2c.h
 * @author MCD Application Team
          Header file of I2C HAL module.
 * @attention
```

```
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 **********************************
 */
./Inc/stm32h7xx hal i2c ex.h
stm32h7xx_hal_i2c_ex.h
/**
 **********************************
          stm32h7xx hal i2c ex.h
 * @author MCD Application Team
          Header file of I2C HAL Extended module.
 ********************************
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 ********************************
 */
./Inc/stm32h7xx hal i2s.h
stm32h7xx_hal_i2s.h
/**
 **********************************
          stm32h7xx hal i2s.h
 * @author MCD Application Team
          Header file of I2S HAL module.
 ***********************************
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_i2s_ex.h
stm32h7xx_hal_i2s_ex.h
/**
 ***********************
          stm32h7xx hal i2s ex.h
 * @author MCD Application Team
 * @brief
          Header file of I2S HAL module.
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx hal irda.h
stm32h7xx_hal_irda.h
/**
 ********************************
 * @file
          stm32h7xx_hal_irda.h
 * @author MCD Application Team
 * @brief
          Header file of IRDA HAL module.
 ***********************************
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 *************************************
 */
./Inc/stm32h7xx hal irda ex.h
stm32h7xx hal irda ex.h
/**
 ******************************
 * @file
          stm32h7xx_hal_irda_ex.h
 * @author MCD Application Team
 * @brief
          Header file of IRDA HAL Extended module.
 ********************************
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 *******************************
 */
./Inc/stm32h7xx hal iwdg.h
stm32h7xx hal iwdg.h
/**
 ************************************
          stm32h7xx_hal_iwdg.h
 * @author MCD Application Team
 * @brief
          Header file of IWDG HAL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_hal_jpeg.h
stm32h7xx_hal_jpeg.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_jpeg.h
 * @author MCD Application Team
 * @brief
          Header file of JPEG HAL module.
 ************************************
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 *********************************
./Inc/stm32h7xx hal lptim.h
stm32h7xx_hal_lptim.h
/**
```

```
@file
          stm32h7xx_hal_lptim.h
          MCD Application Team
 * @author
  @brief
          Header file of LPTIM HAL module.
       @attention
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 ***********************************
 */
./Inc/stm32h7xx_hal_ltdc.h
stm32h7xx_hal_ltdc.h
/**
 *********************************
 * @file
          stm32h7xx_hal_ltdc.h
 * @author MCD Application Team
  @brief
          Header file of LTDC HAL module.
      @attention
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 */
./Inc/stm32h7xx_hal_ltdc_ex.h
stm32h7xx_hal_ltdc_ex.h
/**
 ********************************
 * @file
          stm32h7xx hal ltdc ex.h
 * @author
          MCD Application Team
          Header file of LTDC HAL Extension module.
  @brief
 **********************************
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```

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 **********************************
 */
./Inc/stm32h7xx_hal_mdios.h
stm32h7xx_hal_mdios.h
 *******************************
 * @file
          stm32h7xx hal mdios.h
   @author MCD Application Team
          Header file of MDIOS HAL module.
 ***********************************
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 ********************************
 */
./Inc/stm32h7xx hal mdma.h
stm32h7xx hal mdma.h
/**
 ********************************
 * @file
          stm32h7xx_hal_mdma.h
   @author MCD Application Team
          Header file of DMA HAL module.
 * @brief
 ************************************
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 **********************************
 */
./Inc/stm32h7xx_hal_mmc.h
stm32h7xx hal mmc.h
 ***********************************
 * @file
          stm32h7xx hal mmc.h
 * @author MCD Application Team
```

```
* @brief
          Header file of MMC HAL module.
 ************************************
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 ************************************
 */
./Inc/stm32h7xx_hal_mmc_ex.h
stm32h7xx hal mmc ex.h
 ***********************************
 * @file
           stm32h7xx_hal_mmc_ex.h
 * @author MCD Application Team
          Header file of SD HAL extended module.
 * @brief
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_nand.h
stm32h7xx hal nand.h
/**
 **********************************
 * @file
           stm32h7xx_hal_nand.h
 * @author MCD Application Team
 * @brief
          Header file of NAND HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal nor.h
stm32h7xx hal nor.h
/**
 **********************************
 * @file
          stm32h7xx_hal_nor.h
 * @author MCD Application Team
 * @brief Header file of NOR HAL module.
 **********************************
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 */
./Inc/stm32h7xx_hal_opamp.h
stm32h7xx_hal_opamp.h
/**
 ***********************************
 * @file
          stm32h7xx hal opamp.h
 * @author MCD Application Team
          Header file of OPAMP HAL module.
 * @brief
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 */
./Inc/stm32h7xx_hal_opamp_ex.h
stm32h7xx_hal_opamp_ex.h
/**
 ******************************
 * @file
          stm32h7xx hal opamp ex.h
 * @author MCD Application Team
 * @brief Header file of OPAMP HAL Extended module.
 * @attention
```

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 **********************************
 */
./Inc/stm32h7xx hal ospi.h
stm32h7xx_hal_ospi.h
/**
 **********************************
          stm32h7xx hal ospi.h
 * @author MCD Application Team
 * @brief
          Header file of OSPI HAL module.
 ********************************
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 ********************************
 */
./Inc/stm32h7xx hal otfdec.h
stm32h7xx_hal_otfdec.h
/**
 **********************************
          stm32h7xx hal otfdec.h
 * @author MCD Application Team
          Header file of OTFDEC HAL module.
 ***********************************
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 ************************************
 */
```

```
./Inc/stm32h7xx_hal_pcd.h
stm32h7xx_hal_pcd.h
/**
 **************************
          stm32h7xx hal pcd.h
 * @author MCD Application Team
 * @brief
          Header file of PCD HAL module.
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 ***********************************
 */
./Inc/stm32h7xx hal pcd ex.h
stm32h7xx_hal_pcd_ex.h
/**
 *****************************
 * @file
          stm32h7xx_hal_pcd_ex.h
 * @author MCD Application Team
 * @brief
          Header file of PCD HAL Extension module.
 ************************************
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 *************************************
 */
./Inc/stm32h7xx hal pssi.h
stm32h7xx hal pssi.h
/**
 ******************************
 * @file
          stm32h7xx_hal_pssi.h
 * @author MCD Application Team
 * @brief
          Header file of PSSI HAL module.
 ********************************
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 *******************************
 */
./Inc/stm32h7xx hal pwr.h
stm32h7xx hal pwr.h
/**
 ************************************
          stm32h7xx hal pwr.h
 * @author MCD Application Team
 * @brief
          Header file of PWR HAL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_hal_pwr_ex.h
stm32h7xx_hal_pwr_ex.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_pwr_ex.h
 * @author MCD Application Team
 * @brief
          Header file of PWR HAL Extension module.
 ************************************
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 *********************************
./Inc/stm32h7xx hal qspi.h
stm32h7xx_hal_qspi.h
/**
```

```
@file
          stm32h7xx_hal_qspi.h
 * @author
          MCD Application Team
  @brief
          Header file of QSPI HAL module.
       *************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_ramecc.h
stm32h7xx_hal_ramecc.h
/**
 *********************************
 * @file
          stm32h7xx_hal_ramecc.h
 * @author MCD Application Team
  @brief
          Header file of RAMECC HAL module.
      @attention
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 */
./Inc/stm32h7xx_hal_rcc.h
stm32h7xx_hal_rcc.h
/**
 ********************************
 * @file
          stm32h7xx hal rcc.h
 * @author
          MCD Application Team
          Header file of RCC HAL module.
  @brief
 **********************************
  @attention
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```

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 **********************************
 */
./Inc/stm32h7xx_hal_rcc_ex.h
stm32h7xx_hal_rcc_ex.h
 *******************************
 * @file
          stm32h7xx hal rcc ex.h
   @author MCD Application Team
          Header file of RCC HAL Extension module.
 ***********************************
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 ********************************
 */
./Inc/stm32h7xx hal rng.h
stm32h7xx hal rng.h
/**
 *******************************
 * @file
          stm32h7xx_hal_rng.h
  @author MCD Application Team
          Header file of RNG HAL module.
 ************************************
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 **********************************
 */
./Inc/stm32h7xx_hal_rng_ex.h
stm32h7xx hal rng ex.h
 ***********************************
 * @file
          stm32h7xx_hal_rng_ex.h
 * @author MCD Application Team
```

```
* @brief
          Header file of RNG HAL Extension module.
 ***********************************
   @attention
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 ************************************
 */
./Inc/stm32h7xx_hal_rtc.h
stm32h7xx hal rtc.h
 ***********************************
           stm32h7xx_hal_rtc.h
 * @file
 * @author MCD Application Team
          Header file of RTC HAL module.
 * @brief
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_rtc_ex.h
stm32h7xx hal rtc ex.h
/**
 **********************************
 * @file
           stm32h7xx_hal_rtc_ex.h
 * @author MCD Application Team
          Header file of RTC HAL Extension module.
 * @brief
 **********************************
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```

```
*/
./Inc/stm32h7xx hal sai.h
stm32h7xx hal sai.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_sai.h
 * @author MCD Application Team
 * @brief Header file of SAI HAL module.
 **********************************
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 */
./Inc/stm32h7xx_hal_sai_ex.h
stm32h7xx_hal_sai_ex.h
/**
 ************************
 * @file
           stm32h7xx hal sai ex.h
 * @author MCD Application Team
          Header file of SAI HAL extended module.
 * @brief
   @attention
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 ***********************************
 */
./Inc/stm32h7xx hal sd.h
stm32h7xx_hal_sd.h
/**
 ******************************
 * @file
          stm32h7xx hal sd.h
 * @author MCD Application Team
 * @brief Header file of SD HAL module.
 * @attention
```

```
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 *********************************
 */
./Inc/stm32h7xx hal sdram.h
stm32h7xx_hal_sdram.h
/**
 *********************************
          stm32h7xx hal sdram.h
 * @author MCD Application Team
          Header file of SDRAM HAL module.
 ***********************************
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 *********************************
 */
./Inc/stm32h7xx hal sd ex.h
stm32h7xx_hal_sd ex.h
/**
 **********************************
          stm32h7xx hal sd ex.h
 * @author MCD Application Team
          Header file of SD HAL extended module.
 ***********************************
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 *************************************
 */
```

```
./Inc/stm32h7xx_hal_smartcard.h
stm32h7xx_hal_smartcard.h
/**
 ***********************
          stm32h7xx hal smartcard.h
 * @author MCD Application Team
 * @brief
          Header file of SMARTCARD HAL module.
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx hal smartcard ex.h
stm32h7xx_hal_smartcard_ex.h
/**
 *****************************
 * @file
          stm32h7xx_hal_smartcard_ex.h
 * @author MCD Application Team
 * @brief
          Header file of SMARTCARD HAL Extended module.
 ************************************
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 *************************************
 */
./Inc/stm32h7xx hal smbus.h
stm32h7xx hal smbus.h
/**
 ******************************
 * @file
          stm32h7xx_hal_smbus.h
 * @author MCD Application Team
 * @brief
          Header file of SMBUS HAL module.
 ******************************
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 *******************************
 */
./Inc/stm32h7xx hal spdifrx.h
stm32h7xx hal spdifrx.h
/**
 ************************************
          stm32h7xx_hal_spdifrx.h
 * @author MCD Application Team
 * @brief
          Header file of SPDIFRX HAL module.
 ************************************
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 ***********************************
./Inc/stm32h7xx_hal_spi.h
stm32h7xx_hal_spi.h
/**
 ***********************************
 * @file
          stm32h7xx_hal_spi.h
 * @author MCD Application Team
 * @brief
          Header file of SPI HAL module.
 ************************************
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 *********************************
./Inc/stm32h7xx_hal_spi_ex.h
stm32h7xx_hal_spi_ex.h
/**
```

```
@file
          stm32h7xx_hal_spi_ex.h
          MCD Application Team
 * @author
  @brief
          Header file of SPI HAL Extended module.
        *************************
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 **********************************
./Inc/stm32h7xx_hal_sram.h
stm32h7xx_hal_sram.h
/**
 *********************************
 * @file
          stm32h7xx_hal_sram.h
 * @author MCD Application Team
  @brief
          Header file of SRAM HAL module.
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 */
./Inc/stm32h7xx_hal_swpmi.h
stm32h7xx_hal_swpmi.h
/**
 ********************************
 * @file
          stm32h7xx hal swpmi.h
 * @author MCD Application Team
          Header file of SWPMI HAL module.
  @brief
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_tim.h
stm32h7xx_hal_tim.h
 *******************************
 * @file
          stm32h7xx hal tim.h
   @author MCD Application Team
          Header file of TIM HAL module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx hal tim ex.h
stm32h7xx hal tim ex.h
/**
 *******************************
 * @file
          stm32h7xx_hal_tim_ex.h
  @author MCD Application Team
          Header file of TIM HAL Extended module.
 * @brief
 ***********************************
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 **********************************
 */
./Inc/stm32h7xx_hal_uart.h
stm32h7xx hal uart.h
 ***********************************
 * @file
          stm32h7xx hal uart.h
 * @author MCD Application Team
```

```
Header file of UART HAL module.
 * @brief
 ***********************************
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 ************************************
 */
./Inc/stm32h7xx_hal_uart_ex.h
stm32h7xx hal uart ex.h
 ***********************************
 * @file
           stm32h7xx_hal_uart_ex.h
 * @author
          MCD Application Team
          Header file of UART HAL Extended module.
 * @brief
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_hal_usart.h
stm32h7xx hal usart.h
/**
 ***********************************
 * @file
           stm32h7xx_hal_usart.h
 * @author MCD Application Team
 * @brief
          Header file of USART HAL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx hal usart ex.h
stm32h7xx hal usart ex.h
/**
 ***********************************
 * @file
           stm32h7xx_hal_usart_ex.h
 * @author MCD Application Team
          Header file of USART HAL Extended module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_hal_wwdg.h
stm32h7xx_hal_wwdg.h
/**
 ***********************************
 * @file
           stm32h7xx hal wwdg.h
 * @author MCD Application Team
           Header file of WWDG HAL module.
 * @brief
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 ************************************
 */
./Inc/stm32h7xx ll adc.h
stm32h7xx_ll_adc.h
/**
 ******************************
 * @file
           stm32h7xx ll adc.h
 * @author MCD Application Team
 * @brief Header file of ADC LL module.
 * @attention
```

```
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 *********************************
 */
./Inc/stm32h7xx ll bdma.h
stm32h7xx_11_bdma.h
/**
 *********************************
          stm32h7xx ll bdma.h
 * @author MCD Application Team
          Header file of BDMA LL module.
 ********************************
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 ********************************
 */
./Inc/stm32h7xx ll bus.h
stm32h7xx_ll_bus.h
/**
 ****************************
          stm32h7xx ll bus.h
 * @author MCD Application Team
 * @version $VERSION$
          $DATE$
 * @date
 * @brief Header file of BUS LL module.
./Inc/stm32h7xx ll comp.h
stm32h7xx 11 comp.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_comp.h
 * @author MCD Application Team
 * @brief
          Header file of COMP LL module.
 **********************************
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 */
./Inc/stm32h7xx ll cortex.h
stm32h7xx_ll_cortex.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_cortex.h
 * @author MCD Application Team
 * @brief
          Header file of CORTEX LL module.
./Inc/stm32h7xx_ll_crc.h
stm32h7xx_ll_crc.h
/**
 *********************************
 * @file
          stm32h7xx_ll_crc.h
 * @author MCD Application Team
 * @brief
          Header file of CRC LL module.
       @attention
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 ./Inc/stm32h7xx_ll_crs.h
stm32h7xx_ll_crs.h
/**
 ********************************
 * @file
          stm32h7xx ll crs.h
 * @author MCD Application Team
          Header file of CRS LL module.
 ***********************************
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```

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 ***********************************
 */
./Inc/stm32h7xx_ll_dac.h
stm32h7xx_ll_dac.h
 *******************************
 * @file
          stm32h7xx ll dac.h
   @author MCD Application Team
          Header file of DAC LL module.
 ************************************
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 ********************************
 */
./Inc/stm32h7xx ll delayblock.h
stm32h7xx ll delayblock.h
/**
 *******************************
 * @file
          stm32h7xx_ll_delayblock.h
   @author MCD Application Team
          Header file of Delay Block module.
 ************************************
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 **********************************
 */
./Inc/stm32h7xx_ll_dma.h
stm32h7xx ll dma.h
 ***********************************
 * @file
          stm32h7xx ll dma.h
 * @author MCD Application Team
```

```
* @brief
          Header file of DMA LL module.
 ***********************************
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 ************************************
 */
./Inc/stm32h7xx ll dma2d.h
stm32h7xx ll dma2d.h
 ***********************************
 * @file
           stm32h7xx_11_dma2d.h
 * @author MCD Application Team
          Header file of DMA2D LL module.
 * @brief
 ***********************************
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 ***********************************
 */
./Inc/stm32h7xx_ll_dmamux.h
stm32h7xx 11 dmamux.h
/**
 ***********************************
 * @file
           stm32h7xx_ll_dmamux.h
 * @author MCD Application Team
 * @brief
          Header file of DMAMUX LL module.
 **********************************
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```

```
*/
./Inc/stm32h7xx ll exti.h
stm32h7xx ll exti.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_exti.h
 * @author MCD Application Team
          Header file of EXTI LL module.
 * @brief
 **********************************
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 */
./Inc/stm32h7xx_ll_fmc.h
stm32h7xx_11_fmc.h
/**
 ***********************************
 * @file
           stm32h7xx ll fmc.h
 * @author MCD Application Team
           Header file of FMC HAL module.
 * @brief
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 ************************************
 */
./Inc/stm32h7xx ll gpio.h
stm32h7xx_ll_gpio.h
/**
 *******************************
 * @file
           stm32h7xx ll gpio.h
 * @author MCD Application Team
          Header file of GPIO LL module.
 * @attention
```

```
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 *********************************
 */
./Inc/stm32h7xx ll hrtim.h
stm32h7xx_ll_hrtim.h
/**
 *********************************
          stm32h7xx ll hrtim.h
 * @author MCD Application Team
 * @brief
          Header file of HRTIM LL module.
 ************************************
 * @attention
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 ********************************
 */
./Inc/stm32h7xx ll hsem.h
stm32h7xx_ll_hsem.h
/**
 **********************************
          stm32h7xx ll hsem.h
 * @author MCD Application Team
          Header file of HSEM LL module.
 ***********************************
 * @attention
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 *************************************
 */
```

```
./Inc/stm32h7xx_ll_i2c.h
stm32h7xx ll i2c.h
/**
 ****************************
          stm32h7xx ll i2c.h
 * @author MCD Application Team
 * @brief
          Header file of I2C LL module.
 ********************************
   @attention
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 ***********************************
 */
./Inc/stm32h7xx ll iwdg.h
stm32h7xx_ll_iwdg.h
/**
 *****************************
 * @file
          stm32h7xx_ll_iwdg.h
 * @author MCD Application Team
 * @brief
          Header file of IWDG LL module.
 ********************************
   @attention
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 *************************************
 */
./Inc/stm32h7xx ll lptim.h
stm32h7xx ll lptim.h
/**
 **********************************
 * @file
          stm32h7xx_ll_lptim.h
 * @author MCD Application Team
 * @brief
          Header file of LPTIM LL module.
 *********************************
   @attention
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 *******************************
 */
./Inc/stm32h7xx ll lpuart.h
stm32h7xx ll lpuart.h
/**
 ************************************
          stm32h7xx 11 lpuart.h
 * @author MCD Application Team
 * @brief
          Header file of LPUART LL module.
 ************************************
   @attention
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 ***********************************
./Inc/stm32h7xx_ll_mdma.h
stm32h7xx_ll_mdma.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_mdma.h
 * @author MCD Application Team
 * @brief
          Header file of MDMA LL module.
 ***********************************
   @attention
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 *********************************
./Inc/stm32h7xx ll opamp.h
stm32h7xx_ll_opamp.h
/**
```

```
@file
         stm32h7xx_ll_opamp.h
         MCD Application Team
 * @author
  @brief
         Header file of OPAMP LL module.
       @attention
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 ***********************************
./Inc/stm32h7xx_ll_pwr.h
stm32h7xx_ll_pwr.h
/**
 *********************************
 * @file
         stm32h7xx_ll_pwr.h
 * @author MCD Application Team
  @brief
         Header file of PWR LL module.
      @attention
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 */
./Inc/stm32h7xx_ll_rcc.h
stm32h7xx_ll_rcc.h
/**
 ********************************
 * @file
         stm32h7xx ll rcc.h
 * @author MCD Application Team
 * @version $VERSION$
 * @date
         $DATE$
 * @brief
         Header file of RCC LL module.
 *********************************
  @attention
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 ************************************
 */
./Inc/stm32h7xx_ll_rng.h
stm32h7xx ll rng.h
 ***********************************
 * @file
          stm32h7xx_ll_rng.h
 * @author MCD Application Team
 * @brief
          Header file of RNG LL module.
 ***********************************
  @attention
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 ***********************************
 */
./Inc/stm32h7xx_ll_rtc.h
stm32h7xx_ll_rtc.h
 **********************************
 * @file
          stm32h7xx ll rtc.h
 * @author MCD Application Team
          Header file of RTC LL module.
 * @brief
 ***********************************
  @attention
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 */
./Inc/stm32h7xx ll sdmmc.h
stm32h7xx_11_sdmmc.h
/**
```

```
* @file
           stm32h7xx_ll_sdmmc.h
 * @author MCD Application Team
 * @brief
           Header file of SDMMC HAL module.
 **********************************
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 */
./Inc/stm32h7xx_ll_spi.h
stm32h7xx_ll_spi.h
/**
 ***********************************
 * @file
           stm32h7xx ll spi.h
 * @author MCD Application Team
           Header file of SPI LL module.
 * @brief
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 ***********************************
 */
./Inc/stm32h7xx_ll_swpmi.h
stm32h7xx_ll_swpmi.h
/**
 **********************************
 * @file
           stm32h7xx ll swpmi.h
 * @author MCD Application Team
           Header file of SWPMI LL module.
 * @attention
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```

```
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 ********************************
 */
./Inc/stm32h7xx ll system.h
stm32h7xx_ll_system.h
/**
 **********************************
 * @file
          stm32h7xx ll system.h
 * @author MCD Application Team
  @brief
          Header file of SYSTEM LL module.
./Inc/stm32h7xx_ll_tim.h
stm32h7xx_ll_tim.h
/**
 *******************************
 * @file
          stm32h7xx_ll_tim.h
   @author MCD Application Team
          Header file of TIM LL module.
 ************************************
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 *********************************
 */
./Inc/stm32h7xx ll usart.h
stm32h7xx ll usart.h
/**
 ******************************
 * @file
          stm32h7xx ll usart.h
  @author MCD Application Team
          Header file of USART LL module.
 * @brief
 **********************************
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 ***********************************
 */
```

```
./Inc/stm32h7xx_ll_usb.h
stm32h7xx ll usb.h
 ***********************************
 * @file
          stm32h7xx 11 usb.h
 * @author MCD Application Team
 * @brief
          Header file of USB Low Layer HAL module.
 **********************************
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 ***********************************
 */
./Inc/stm32h7xx_ll_utils.h
stm32h7xx ll utils.h
 ********************************
 * @file
          stm32h7xx ll utils.h
 * @author MCD Application Team
          Header file of UTILS LL module.
 * @brief
./Inc/stm32h7xx_ll_wwdg.h
stm32h7xx_ll_wwdg.h
/**
 ***********************************
 * @file
          stm32h7xx_ll_wwdg.h
 * @author MCD Application Team
 * @brief
          Header file of WWDG LL module.
 ***********************************
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 ********************************
./Inc/stm32 assert template.h
stm32_assert_template.h
/**
```

```
@file
          stm32_assert.h
   @author
          MCD Application Team
   @brief
          STM32 assert template file.
          This file should be copied to the application folder and renamed
          to stm32 assert.h.
 ************************************
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 **********************************
 */
./Inc/system stm32h7xx.h
system stm32h7xx.h
 *******************************
 * @file
          system_stm32h7xx.h
   @author MCD Application Team
          CMSIS Cortex-Mx Device System Source File for STM32H7xx devices.
 @attention
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 *******************************
 */
./Src/stm32h7xx_hal.c
stm32h7xx hal.c
 *******************************
 * @file
          stm32h7xx hal.c
 * @author MCD Application Team
 * @brief
          HAL module driver.
          This is the common part of the HAL initialization
./Src/stm32h7xx hal adc.c
stm32h7xx_hal_adc.c
/**
```

```
@file
            stm32h7xx_hal_adc.c
   @author
            MCD Application Team
   @brief
            This file provides firmware functions to manage the following
            functionalities of the Analog to Digital Convertor (ADC)
            peripheral:
             + Initialization and de-initialization functions
               ++ Initialization and Configuration of ADC
             + Operation functions
               ++ Start, stop, get result of conversions of regular
                  group, using 3 possible modes: polling, interruption or DMA.
             + Control functions
               ++ Channels configuration on regular group
               ++ Analog Watchdog configuration
             + State functions
               ++ ADC state machine management
               ++ Interrupts and flags management
            Other functions (extended functions) are available in file
            "stm32h7xx_hal_adc_ex.c".
./Src/stm32h7xx hal adc ex.c
stm32h7xx_hal_adc_ex.c
/**
 *****************************
   @file
            stm32h7xx_hal_adc_ex.c
            MCD Application Team
   @author
   @brief
            This file provides firmware functions to manage the following
            functionalities of the Analog to Digital Convertor (ADC)
  *
            peripheral:
             + Operation functions
               ++ Start, stop, get result of conversions of ADC group injected,
                  using 2 possible modes: polling, interruption.
               ++ Calibration
                 +++ ADC automatic self-calibration
                 +++ Calibration factors get or set
               ++ Multimode feature when available
             + Control functions
               ++ Channels configuration on ADC group injected
             + State functions
               ++ ADC group injected contexts queue management
            Other functions (generic functions) are available in file
            "stm32h7xx hal adc.c".
./Src/stm32h7xx hal cec.c
stm32h7xx_hal_cec.c
/**
  **********************************
  * @file
            stm32h7xx hal cec.c
  * @author MCD Application Team
   @brief
            CEC HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the High Definition Multimedia Interface
```

```
Consumer Electronics Control Peripheral (CEC).
 *
            + Initialization and de-initialization function
            + IO operation function
            + Peripheral Control function
./Src/stm32h7xx_hal_comp.c
stm32h7xx_hal_comp.c
/**
 **********************************
           stm32h7xx hal comp.c
   @file
           MCD Application Team
   @author
   @brief
           COMP HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the COMP peripheral:
            + Initialization and de-initialization functions
            + Start/Stop operation functions in polling mode
            + Start/Stop operation functions in interrupt mode
            + Peripheral control functions
            + Peripheral state functions
./Src/stm32h7xx_hal_cortex.c
stm32h7xx_hal_cortex.c
 **********************************
 * @file
           stm32h7xx hal cortex.c
 * @author
           MCD Application Team
           CORTEX HAL module driver.
   @brief
           This file provides firmware functions to manage the following
 *
           functionalities of the CORTEX:
            + Initialization and de-initialization functions
            + Peripheral Control functions
./Src/stm32h7xx hal crc.c
stm32h7xx_hal_crc.c
/**
 *********************************
 * @file
           stm32h7xx hal crc.c
   @author
           MCD Application Team
   @brief
           CRC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Cyclic Redundancy Check (CRC) peripheral:
            + Initialization and de-initialization functions
            + Peripheral Control functions
 *
            + Peripheral State functions
./Src/stm32h7xx hal crc ex.c
stm32h7xx_hal_crc_ex.c
/**
 ************************
 * @file
           stm32h7xx_hal_crc_ex.c
```

```
* @author MCD Application Team
   @brief
           Extended CRC HAL module driver.
           This file provides firmware functions to manage the extended
           functionalities of the CRC peripheral.
./Src/stm32h7xx_hal_cryp.c
stm32h7xx_hal_cryp.c
 *******************************
   @file
            stm32h7xx hal cryp.c
   @author
           MCD Application Team
 * @brief
           CRYP HAL module driver.
           This file provides firmware functions to manage the following
            functionalities of the Cryptography (CRYP) peripheral:
 *
            + Initialization and de-initialization functions
            + AES processing functions
            + DES processing functions
            + TDES processing functions
            + DMA callback functions
            + CRYP IRQ handler management
            + Peripheral State functions
./Src/stm32h7xx_hal_cryp_ex.c
stm32h7xx_hal_cryp_ex.c
/**
 *************************
 * @file
           stm32h7xx hal cryp ex.c
 * @author MCD Application Team
           Extended CRYP HAL module driver
 * @brief
           This file provides firmware functions to manage the following
 *
           functionalities of CRYP extension peripheral:
            + Extended AES processing functions
./Src/stm32h7xx_hal_dac.c
stm32h7xx hal dac.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_dac.c
 * @author MCD Application Team
 * @brief
           DAC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Digital to Analog Converter (DAC) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_dac_ex.c
stm32h7xx_hal_dac_ex.c
```

```
/**
 ***********************************
 * @file
           stm32h7xx hal dac ex.c
   @author
           MCD Application Team
           Extended DAC HAL module driver.
   @brief
           This file provides firmware functions to manage the extended
 *
           functionalities of the DAC peripheral.
./Src/stm32h7xx hal dcmi.c
stm32h7xx_hal_dcmi.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_dcmi.c
   @author
           MCD Application Team
   @brief
           DCMI HAL module driver
           This file provides firmware functions to manage the following
           functionalities of the Digital Camera Interface (DCMI) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
 *
            + Peripheral State and Error functions
./Src/stm32h7xx_hal_dfsdm.c
stm32h7xx hal dfsdm.c
/**
 **********************************
   @file
           stm32h7xx_hal_dfsdm.c
   @author
           MCD Application Team
           This file provides firmware functions to manage the following
   @brief
           functionalities of the Digital Filter for Sigma-Delta Modulators
            (DFSDM) peripherals:
 *
            + Initialization and configuration of channels and filters
            + Regular channels configuration
            + Injected channels configuration
            + Regular/Injected Channels DMA Configuration
            + Interrupts and flags management
            + Analog watchdog feature
            + Short-circuit detector feature
            + Extremes detector feature
            + Clock absence detector feature
            + Break generation on analog watchdog or short-circuit event
./Src/stm32h7xx_hal_dfsdm_ex.c
stm32h7xx_hal_dfsdm_ex.c
/**
 ****************************
 * @file
           stm32h7xx hal dfsdm ex.c
 * @author
           MCD Application Team
 * @brief
           DFSDM Extended HAL module driver.
           This file provides firmware functions to manage the following
```

```
functionality of the DFSDM Peripheral Controller:
 *
            + Set and get pulses skipping on channel.
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 */
./Src/stm32h7xx_hal_dma.c
stm32h7xx_hal_dma.c
/**
 ***********************************
 * @file
           stm32h7xx hal dma.c
 * @author MCD Application Team
   @brief
           DMA HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Direct Memory Access (DMA) peripheral:
            + Initialization and de-initialization functions
 *
            + IO operation functions
            + Peripheral State and errors functions
./Src/stm32h7xx_hal_dma2d.c
stm32h7xx_hal_dma2d.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_dma2d.c
           MCD Application Team
 * @author
   @brief
           DMA2D HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the DMA2D peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal dma ex.c
stm32h7xx_hal_dma_ex.c
/**
 **********************************
 * @file
           stm32h7xx hal dma ex.c
 * @author MCD Application Team
   @brief
           DMA Extension HAL module driver
           This file provides firmware functions to manage the following
           functionalities of the DMA Extension peripheral:
```

```
+ Extended features functions
./Src/stm32h7xx hal dsi.c
stm32h7xx hal dsi.c
/**
 **********************************
 * @file
           stm32h7xx_hal_dsi.c
           MCD Application Team
   @author
           DSI HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of the DSI peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_dts.c
stm32h7xx_hal_dts.c
/**
 **********************************
 * @file
           stm32h7xx hal dts.c
   @author
           MCD Application Team
   @brief
           DTS HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the DTS peripheral:
            + Initialization and de-initialization functions
            + Start/Stop operation functions in polling mode.
            + Start/Stop operation functions in interrupt mode.
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_eth.c
stm32h7xx_hal_eth.c
/**
 ********************************
           stm32h7xx hal eth.c
 * @author MCD Application Team
   @brief
           ETH HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Ethernet (ETH) peripheral:
            + Initialization and deinitialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_eth_ex.c
stm32h7xx hal eth ex.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_eth_ex.c
 * @author MCD Application Team
```

```
* @brief
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx hal exti.c
stm32h7xx_hal_exti.c
/**
 ************************************
 * @file
           stm32h7xx hal exti.c
           MCD Application Team
 * @author
   @brief
           EXTI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the General Purpose Input/Output (EXTI)
peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
./Src/stm32h7xx_hal_fdcan.c
stm32h7xx_hal_fdcan.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_fdcan.c
   @author
           MCD Application Team
   @brief
           FDCAN HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Flexible DataRate Controller Area Network
 *
           (FDCAN) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Configuration and Control functions
 *
            + Peripheral State and Error functions
./Src/stm32h7xx_hal_flash.c
stm32h7xx_hal_flash.c
/**
 ****************************
 * @file
           stm32h7xx hal flash.c
 * @author
           MCD Application Team
 * @brief
           FLASH HAL module driver.
           This file provides firmware functions to manage the following
```

ETH HAL Extended module driver.

```
functionalities of the internal FLASH memory:
 *
            + Program operations functions
 *
            + Memory Control functions
            + Peripheral Errors functions
./Src/stm32h7xx_hal_flash_ex.c
stm32h7xx_hal_flash_ex.c
 *******************************
   @file
           stm32h7xx_hal_flash_ex.c
   @author
           MCD Application Team
 * @brief
           Extended FLASH HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the FLASH extension peripheral:
 *
            + Extended programming operations functions
./Src/stm32h7xx_hal_gfxmmu.c
stm32h7xx_hal_gfxmmu.c
/**
 *********************************
   @file
           stm32h7xx_hal_gfxmmu.c
   @author
           MCD Application Team
   @brief
           This file provides firmware functions to manage the following
           functionalities of the Graphic MMU (GFXMMU) peripheral:
            + Initialization and De-initialization.
            + LUT configuration.
            + Force flush and/or invalidate of cache.
 *
            + Modify physical buffer adresses.
            + Modify cache and pre-fetch parameters.
            + Error management.
./Src/stm32h7xx_hal_gpio.c
stm32h7xx hal gpio.c
/**
 ******************************
 * @file
           stm32h7xx hal gpio.c
 * @author MCD Application Team
           GPIO HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
           functionalities of the General Purpose Input/Output (GPIO)
peripheral:
            + Initialization and de-initialization functions
 *
            + IO operation functions
./Src/stm32h7xx_hal_hash.c
stm32h7xx hal hash.c
/**
 ***********************************
 * @file
           stm32h7xx hal hash.c
 * @author MCD Application Team
```

```
HASH HAL module driver.
   @brief
            This file provides firmware functions to manage the following
 *
            functionalities of the HASH peripheral:
             + Initialization and de-initialization methods
             + HASH or HMAC processing in polling mode
            + HASH or HMAC processing in interrupt mode
             + HASH or HMAC processing in DMA mode
             + Peripheral State methods
  *
             + HASH or HMAC processing suspension/resumption
./Src/stm32h7xx hal hash ex.c
stm32h7xx_hal_hash_ex.c
  *********************************
   @file
            stm32h7xx_hal_hash_ex.c
   @author
            MCD Application Team
   @brief
            Extended HASH HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the HASH peripheral for SHA-224 and SHA-256
            alogrithms:
             + HASH or HMAC processing in polling mode
             + HASH or HMAC processing in interrupt mode
             + HASH or HMAC processing in DMA mode
           Additionally, this file provides functions to manage HMAC
           multi-buffer DMA-based processing for MD-5, SHA-1, SHA-224
           and SHA-256.
  *
./Src/stm32h7xx_hal_hcd.c
stm32h7xx_hal_hcd.c
/**
  ***********************************
  * @file
            stm32h7xx hal hcd.c
            MCD Application Team
   @author
   @brief
            HCD HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the USB Peripheral Controller:
             + Initialization and de-initialization functions
            + IO operation functions
             + Peripheral Control functions
             + Peripheral State functions
./Src/stm32h7xx hal hrtim.c
stm32h7xx_hal_hrtim.c
/**
  *********************************
  * @file
            stm32h7xx hal hrtim.c
  * @author
           MCD Application Team
   @brief
            TIM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the High Resolution Timer (HRTIM) peripheral:
```

```
+ HRTIM Initialization
             + Timer Time Base Unit Configuration
             + Simple Time Base Start/Stop
             + Simple Time Base Start/Stop Interrupt
             + Simple Time Base Start/Stop DMA Request
             + Simple Output Compare/PWM Channel Configuration
             + Simple Output Compare/PWM Channel Start/Stop Interrupt
             + Simple Output Compare/PWM Channel Start/Stop DMA Request
             + Simple Input Capture Channel Configuration
             + Simple Input Capture Channel Start/Stop Interrupt
             + Simple Input Capture Channel Start/Stop DMA Request
             + Simple One Pulse Channel Configuration
             + Simple One Pulse Channel Start/Stop Interrupt
             + HRTIM External Synchronization Configuration
             + HRTIM Burst Mode Controller Configuration
             + HRTIM Burst Mode Controller Enabling
             + HRTIM External Events Conditioning Configuration
             + HRTIM Faults Conditioning Configuration
             + HRTIM Faults Enabling
             + HRTIM ADC trigger Configuration
             + Waveform Timer Configuration
             + Waveform Event Filtering Configuration
             + Waveform Dead Time Insertion Configuration
             + Waveform Chopper Mode Configuration
             + Waveform Compare Unit Configuration
             + Waveform Capture Unit Configuration
             + Waveform Output Configuration
             + Waveform Counter Start/Stop
             + Waveform Counter Start/Stop Interrupt
             + Waveform Counter Start/Stop DMA Request
             + Waveform Output Enabling
             + Waveform Output Level Set/Get
             + Waveform Output State Get
             + Waveform Burst DMA Operation Configuration
             + Waveform Burst DMA Operation Start
             + Waveform Timer Counter Software Reset
             + Waveform Capture Software Trigger
             + Waveform Burst Mode Controller Software Trigger
             + Waveform Timer Pre-loadable Registers Update Enabling
             + Waveform Timer Pre-loadable Registers Software Update
             + Waveform Timer Delayed Protection Status Get
             + Waveform Timer Burst Status Get
             + Waveform Timer Push-Pull Status Get
             + Peripheral State Get
./Src/stm32h7xx hal hsem.c
stm32h7xx_hal_hsem.c
 *********************************
 * @file
            stm32h7xx hal hsem.c
 * @author MCD Application Team
   @brief
            HSEM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the semaphore peripheral:
```

```
*
            + Semaphore FastTake function (1-Step Procedure) , non blocking
            + Semaphore Status check
            + Semaphore Clear Key Set and Get
            + Release and release all functions
            + Semaphore notification enabling and disabling and callnack
functions
            + IRQ handler management
 *
./Src/stm32h7xx hal i2c.c
stm32h7xx_hal_i2c.c
 *********************************
   @file
           stm32h7xx hal i2c.c
   @author MCD Application Team
   @brief
           I2C HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Inter Integrated Circuit (I2C) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
 *
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_i2c_ex.c
stm32h7xx hal i2c ex.c
/**
 ***********************************
   @file
           stm32h7xx_hal_i2c_ex.c
   @author MCD Application Team
           I2C Extended HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of I2C Extended peripheral:
 *
            + Extended features functions
./Src/stm32h7xx hal i2s.c
stm32h7xx_hal_i2s.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_i2s.c
   @author
           MCD Application Team
   @brief
           I2S HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Integrated Interchip Sound (I2S) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal i2s ex.c
stm32h7xx_hal_i2s_ex.c
/**
 ***********************************
```

+ Semaphore Take function (2-Step Procedure), non blocking

```
* @file
            stm32h7xx_hal_i2s_ex.c
  * @author
           MCD Application Team
   @brief
            I2S HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of I2S extension peripheral:
             + Extension features Functions
./Src/stm32h7xx_hal_irda.c
stm32h7xx hal irda.c
  ***********************************
  * @file
            stm32h7xx hal irda.c
  * @author
            MCD Application Team
            IRDA HAL module driver.
  * @brief
            This file provides firmware functions to manage the following
 *
            functionalities of the IrDA (Infrared Data Association) Peripheral
            (IRDA)
             + Initialization and de-initialization functions
             + IO operation functions
             + Peripheral State and Errors functions
             + Peripheral Control functions
./Src/stm32h7xx_hal_iwdg.c
stm32h7xx_hal_iwdg.c
/**
  ***********************************
  * @file
            stm32h7xx hal iwdg.c
  * @author MCD Application Team
   @brief
            IWDG HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the Independent Watchdog (IWDG) peripheral:
             + Initialization and Start functions
  *
             + IO operation functions
./Src/stm32h7xx hal jpeg.c
stm32h7xx_hal_jpeg.c
/**
  ***********************************
  * @file
            stm32h7xx_hal_jpeg.c
   @author
            MCD Application Team
   @brief
            JPEG HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the JPEG encoder/decoder peripheral:
  *
             + Initialization and de-initialization functions
  *
             + JPEG processing functions encoding and decoding
  *
             + JPEG decoding Getting Info and encoding configuration setting
  *
             + JPEG enable/disable header parsing functions (for decoding)
             + JPEG Input/Output Buffer configuration.
             + JPEG callback functions
             + JPEG Abort/Pause/Resume functions
             + JPEG custom quantization tables setting functions
```

```
+ IRQ handler management
 *
            + Peripheral State and Error functions
./Src/stm32h7xx hal lptim.c
stm32h7xx_hal_lptim.c
 *****************************
   @file
           stm32h7xx_hal_lptim.c
           MCD Application Team
   @author
   @brief
           LPTIM HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Low Power Timer (LPTIM) peripheral:
            + Initialization and de-initialization functions.
            + Start/Stop operation functions in polling mode.
            + Start/Stop operation functions in interrupt mode.
 *
            + Reading operation functions.
            + Peripheral State functions.
./Src/stm32h7xx hal ltdc.c
stm32h7xx hal ltdc.c
/**
 *******************************
  @file
           stm32h7xx_hal_ltdc.c
   @author MCD Application Team
 * @brief
           LTDC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the LTDC peripheral:
 *
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal ltdc ex.c
stm32h7xx_hal_ltdc_ex.c
/**
 ****************************
 * @file
           stm32h7xx_hal_ltdc_ex.c
 * @author MCD Application Team
 * @brief
           LTDC Extension HAL module driver.
 ************************************
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 ********************************
```

```
*/
./Src/stm32h7xx hal mdios.c
stm32h7xx hal mdios.c
/**
 **********************************
           stm32h7xx_hal_mdios.c
           MCD Application Team
   @author
   @brief
           MDIOS HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the MDIOS Peripheral.
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
./Src/stm32h7xx_hal_mdma.c
stm32h7xx_hal_mdma.c
/**
 ***********************************
 * @file
           stm32h7xx hal mdma.c
 * @author MCD Application Team
   @brief This file provides firmware functions to manage the following
          functionalities of the Master Direct Memory Access (MDMA)
peripheral:
            + Initialization/de-initialization functions
            + I/O operation functions
            + Peripheral State and errors functions
./Src/stm32h7xx_hal_mmc.c
stm32h7xx_hal_mmc.c
/**
 ***********************************
 * @file
           stm32h7xx hal mmc.c
           MCD Application Team
   @author
   @brief
           MMC card HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Secure Digital (MMC) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + MMC card Control functions
./Src/stm32h7xx hal mmc ex.c
stm32h7xx_hal_mmc_ex.c
/**
 **********************************
 * @file
           stm32h7xx hal mmc ex.c
 * @author MCD Application Team
   @brief
           MMC card Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Secure Digital (MMC) peripheral:
```

```
+ Extended features functions
./Src/stm32h7xx hal msp.c
stm32h7xx hal msp.c
/**
 **********************************
 * @file
           stm32h7xx_hal_msp_template.c
 * @author MCD Application Team
   @brief
           HAL MSP module.
           This file template is located in the HAL folder and should be
copied
           to the user folder.
./Src/stm32h7xx hal nand.c
stm32h7xx hal nand.c
 ************************
 * @file
           stm32h7xx_hal_nand.c
 * @author
           MCD Application Team
 * @brief
           NAND HAL module driver.
           This file provides a generic firmware to drive NAND memories
mounted
 *
           as external device.
./Src/stm32h7xx hal nor.c
stm32h7xx hal nor.c
/**
 *******************************
           stm32h7xx_hal_nor.c
   @file
   @author MCD Application Team
 * @brief
           NOR HAL module driver.
           This file provides a generic firmware to drive NOR memories mounted
 *
           as external device.
./Src/stm32h7xx hal opamp.c
stm32h7xx_hal_opamp.c
/**
 *************************
 * @file
           stm32h7xx hal opamp.c
   @author
           MCD Application Team
   @brief
           OPAMP HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the operational amplifier(s) peripheral:
 *
            + OPAMP configuration
 *
            + OPAMP calibration
 *
           Thanks to
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State functions
```

```
./Src/stm32h7xx hal opamp ex.c
stm32h7xx hal opamp ex.c
/**
 ***********************************
           stm32h7xx_hal_opamp_ex.c
           MCD Application Team
   @author
   @brief
           Extended OPAMP HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the operational amplifier(s)(OPAMP1, OPAMP2 etc)
           peripheral:
            + Extended Initialization and de-initialization functions
            + Extended Peripheral Control functions
 **********************************
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 ***********************************
 */
./Src/stm32h7xx_hal_ospi.c
stm32h7xx_hal_ospi.c
/**
 *******************************
 * @file
           stm32h7xx hal ospi.c
 * @author MCD Application Team
           OSPI HAL module driver.
 * @brief
./Src/stm32h7xx hal otfdec.c
stm32h7xx_hal_otfdec.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_otfdec.c
 * @author
           MCD Application Team
   @brief
           OTFDEC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the On-The-Fly Decryption (OTFDEC) peripheral:
            + Initialization and de-initialization functions
            + Region setting/enable functions
            + Peripheral State functions
./Src/stm32h7xx hal pcd.c
stm32h7xx_hal_pcd.c
/**
```

```
@file
           stm32h7xx_hal_pcd.c
   @author
           MCD Application Team
   @brief
           PCD HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the USB Peripheral Controller:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx hal pcd ex.c
stm32h7xx_hal_pcd_ex.c
/**
 **********************************
           stm32h7xx_hal_pcd_ex.c
 * @author MCD Application Team
   @brief
           PCD Extended HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the USB Peripheral Controller:
            + Extended features functions
 *******************************
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 ***********************************
./Src/stm32h7xx hal pssi.c
stm32h7xx_hal_pssi.c
/**
 ***********************************
 * @file
           stm32h7xx_hal_pssi.c
 * @author
           MCD Application Team
   @brief
           PSSI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Parallel Synchronous Slave Interface (PSSI)
peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and Errors functions
./Src/stm32h7xx hal pwr.c
stm32h7xx_hal_pwr.c
```

```
/**
 ***********************************
 * @file
           stm32h7xx_hal_pwr.c
   @author MCD Application Team
           PWR HAL module driver.
   @brief
           This file provides firmware functions to manage the following
 *
           functionalities of the Power Controller (PWR) peripheral:
            + Initialization and de-initialization functions.
 *
            + Peripheral Control functions.
            + Interrupt Handling functions.
./Src/stm32h7xx_hal_pwr_ex.c
stm32h7xx_hal_pwr_ex.c
/**
 **********************************
   @file
           stm32h7xx_hal_pwr_ex.c
   @author MCD Application Team
   @brief
           Extended PWR HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of PWR extension peripheral:
            + Peripheral Extended features functions
./Src/stm32h7xx_hal_qspi.c
stm32h7xx_hal_qspi.c
/**
 *********************************
 * @file
           stm32h7xx hal qspi.c
           MCD Application Team
   @author
           QSPI HAL module driver.
   @brief
           This file provides firmware functions to manage the following
 *
           functionalities of the QuadSPI interface (QSPI).
            + Initialization and de-initialization functions
            + Indirect functional mode management
            + Memory-mapped functional mode management
            + Auto-polling functional mode management
            + Interrupts and flags management
            + MDMA channel configuration for indirect functional mode
            + Errors management and abort functionality
./Src/stm32h7xx_hal_ramecc.c
stm32h7xx hal ramecc.c
/**
 *******************************
   @file
           stm32h7xx hal ramecc.c
   @author
           MCD Application Team
 * @brief
           RAMECC HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the RAM ECC monitoring (RAMECC) peripheral:
            + Initialization and de-initialization functions
            + Monitoring operation functions
            + Error informations functions
            + State and error functions
```

```
./Src/stm32h7xx_hal_rcc.c
stm32h7xx hal rcc.c
 ***********************************
 * @file
           stm32h7xx hal rcc.c
 * @author MCD Application Team
 * @brief
           RCC HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Reset and Clock Control (RCC) peripheral:
            + Initialization and de-initialization functions
            + Peripheral Control functions
./Src/stm32h7xx_hal_rcc_ex.c
stm32h7xx_hal_rcc_ex.c
/**
 ******************************
 * @file
           stm32h7xx_hal_rcc_ex.c
 * @author MCD Application Team
 * @brief
           Extended RCC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities RCC extension peripheral:
 *
            + Extended Peripheral Control functions
 ***********************************
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 ***********************************
./Src/stm32h7xx_hal rng.c
stm32h7xx_hal_rng.c
/**
 ********************************
   @file
           stm32h7xx hal rng.c
 * @author MCD Application Team
 * @brief
           RNG HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Random Number Generator (RNG) peripheral:
            + Initialization and configuration functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_rng_ex.c
```

```
stm32h7xx_hal_rng_ex.c
 *******************************
   @file
           stm32h7xx hal rng ex.c
   @author MCD Application Team
   @brief
           Extended RNG HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Random Number Generator (RNG) peripheral:
            + Lock configuration functions
            + Reset the RNG
 ***********************************
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 **********************************
./Src/stm32h7xx_hal_rtc.c
stm32h7xx hal rtc.c
/**
 ***********************************
   @file
           stm32h7xx_hal_rtc.c
           MCD Application Team
   @author
           RTC HAL module driver.
   @brief
           This file provides firmware functions to manage the following
           functionalities of the Real-Time Clock (RTC) peripheral:
 *
            + Initialization/de-initialization
            + Calendar (Time and Date) configuration
            + Alarms (Alarm A and Alarm B) configuration
            + WakeUp Timer configuration
            + TimeStamp configuration
            + Tampers configuration
            + Backup Data Registers configuration
            + RTC Tamper and TimeStamp Pins Selection
            + Interrupts and flags management
./Src/stm32h7xx hal rtc ex.c
stm32h7xx_hal_rtc_ex.c
/**
 ******************************
 * @file
           stm32h7xx hal rtc ex.c
 * @author MCD Application Team
   @brief
           Extended RTC HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Real Time Clock (RTC) Extended peripheral:
```

```
+ RTC Time Stamp functions
 *
            + RTC Tamper functions
            + RTC Wake-up functions
            + Extended Control functions
            + Extended RTC features functions
./Src/stm32h7xx_hal_sai.c
stm32h7xx_hal_sai.c
/**
 *****************************
 * @file
           stm32h7xx hal sai.c
   @author MCD Application Team
   @brief
           SAI HAL module driver.
           This file provides firmware functions to manage the following
 *
           functionalities of the Serial Audio Interface (SAI) peripheral:
            + Initialization/de-initialization functions
            + I/O operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_sai_ex.c
stm32h7xx_hal_sai_ex.c
 *********************************
 * @file
           stm32h7xx hal sai ex.c
 * @author MCD Application Team
 * @brief
           SAI Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionality of the SAI Peripheral Controller:
            + Modify PDM microphone delays.
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx_hal_sd.c
stm32h7xx_hal_sd.c
/**
 ***********************************
           stm32h7xx hal sd.c
 * @author MCD Application Team
 * @brief
           SD card HAL module driver.
```

```
*
           functionalities of the Secure Digital (SD) peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_hal_sdram.c
stm32h7xx hal sdram.c
 ***********************************
 * @file
           stm32h7xx hal sdram.c
 * @author
           MCD Application Team
 * @brief
           SDRAM HAL module driver.
           This file provides a generic firmware to drive SDRAM memories
mounted
 *
           as external device.
./Src/stm32h7xx hal sd ex.c
stm32h7xx hal sd ex.c
/**
 **********************************
 * @file
           stm32h7xx_hal_sd_ex.c
   @author MCD Application Team
 * @brief
           SD card Extended HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Secure Digital (SD) peripheral:
 *
            + Extended features functions
./Src/stm32h7xx hal smartcard.c
stm32h7xx_hal_smartcard.c
/**
 ***********************************
   @file
           stm32h7xx_hal_smartcard.c
           MCD Application Team
   @author
           SMARTCARD HAL module driver.
   @brief
           This file provides firmware functions to manage the following
 *
           functionalities of the SMARTCARD peripheral:
 *
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
 *
            + Peripheral State and Error functions
./Src/stm32h7xx_hal_smartcard_ex.c
stm32h7xx_hal_smartcard_ex.c
/**
 ***********************************
           stm32h7xx_hal_smartcard_ex.c
 * @author MCD Application Team
 * @brief
           SMARTCARD HAL module driver.
```

This file provides firmware functions to manage the following

```
This file provides extended firmware functions to manage the
following
            functionalities of the SmartCard.
 *
            + Initialization and de-initialization functions
 *
            + Peripheral Control functions
./Src/stm32h7xx_hal_smbus.c
stm32h7xx_hal_smbus.c
 ******************************
 * @file
            stm32h7xx hal smbus.c
 * @author MCD Application Team
 * @brief
           SMBUS HAL module driver.
            This file provides firmware functions to manage the following
 *
            functionalities of the System Management Bus (SMBus) peripheral,
            based on I2C principles of operation :
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral State and Errors functions
./Src/stm32h7xx_hal_spdifrx.c
stm32h7xx_hal_spdifrx.c
 **********************************
 * @file
            stm32h7xx hal spdifrx.c
 * @author MCD Application Team
 * @brief
           This file provides firmware functions to manage the following
            functionalities of the SPDIFRX audio interface:
 *
            + Initialization and Configuration
            + Data transfers functions
            + DMA transfers management
            + Interrupts and flags management
./Src/stm32h7xx hal spi.c
stm32h7xx_hal_spi.c
/**
 ******************************
            stm32h7xx hal spi.c
 * @file
 * @author
           MCD Application Team
 * @brief
           SPI HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Serial Peripheral Interface (SPI)
peripheral:
            + Initialization and de-initialization functions
            + IO operation functions
            + Peripheral Control functions
 *
            + Peripheral State functions
./Src/stm32h7xx_hal_spi_ex.c
stm32h7xx_hal_spi_ex.c
/**
```

```
@file
           stm32h7xx_hal_spi_ex.c
   @author
           MCD Application Team
   @brief
           Extended SPI HAL module driver.
           This file provides firmware functions to manage the following
           SPI peripheral extended functionalities :
            + IO operation functions
            + Peripheral Control functions
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx hal sram.c
stm32h7xx_hal_sram.c
/**
 *********************************
 * @file
           stm32h7xx hal sram.c
 * @author
           MCD Application Team
   @brief
           SRAM HAL module driver.
           This file provides a generic firmware to drive SRAM memories
           mounted as external device.
./Src/stm32h7xx_hal_swpmi.c
stm32h7xx hal swpmi.c
/**
 *******************************
 * @file
           stm32h7xx hal swpmi.c
   @author MCD Application Team
 * @brief
           SWPMI HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Single Wire Protocol Master Interface
(SWPMI).
            + Initialization and Configuration
            + Data transfers functions
 *
            + DMA transfers management
            + Interrupts and flags management
./Src/stm32h7xx hal tim.c
stm32h7xx_hal_tim.c
/**
 *************************
 * @file
           stm32h7xx_hal_tim.c
```

```
MCD Application Team
   @brief
            TIM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Timer (TIM) peripheral:
             + TIM Time Base Initialization
             + TIM Time Base Start
             + TIM Time Base Start Interruption
             + TIM Time Base Start DMA
             + TIM Output Compare/PWM Initialization
             + TIM Output Compare/PWM Channel Configuration
             + TIM Output Compare/PWM Start
             + TIM Output Compare/PWM Start Interruption
             + TIM Output Compare/PWM Start DMA
             + TIM Input Capture Initialization
             + TIM Input Capture Channel Configuration
             + TIM Input Capture Start
             + TIM Input Capture Start Interruption
             + TIM Input Capture Start DMA
             + TIM One Pulse Initialization
             + TIM One Pulse Channel Configuration
             + TIM One Pulse Start
             + TIM Encoder Interface Initialization
             + TIM Encoder Interface Start
             + TIM Encoder Interface Start Interruption
             + TIM Encoder Interface Start DMA
             + Commutation Event configuration with Interruption and DMA
             + TIM OCRef clear configuration
             + TIM External Clock configuration
./Src/stm32h7xx_hal_tim_ex.c
stm32h7xx_hal_tim_ex.c
  **********************************
  * @file
            stm32h7xx_hal_tim_ex.c
  * @author
            MCD Application Team
   @brief
            TIM HAL module driver.
            This file provides firmware functions to manage the following
            functionalities of the Timer Extended peripheral:
             + Time Hall Sensor Interface Initialization
             + Time Hall Sensor Interface Start
             + Time Complementary signal break and dead time configuration
             + Time Master and Slave synchronization configuration
             + Time Output Compare/PWM Channel Configuration (for channels 5
and 6)
             + Timer remapping capabilities configuration
./Src/stm32h7xx_hal_uart.c
stm32h7xx_hal_uart.c
/**
 **************************
  * @file
            stm32h7xx hal uart.c
  * @author
            MCD Application Team
            UART HAL module driver.
  * @brief
            This file provides firmware functions to manage the following
```

@author

```
Peripheral (UART).
            + Initialization and de-initialization functions
 *
            + IO operation functions
 *
            + Peripheral Control functions
./Src/stm32h7xx_hal_uart_ex.c
stm32h7xx hal uart ex.c
 ***********************************
 * @file
           stm32h7xx hal uart ex.c
 * @author
           MCD Application Team
           Extended UART HAL module driver.
 * @brief
           This file provides firmware functions to manage the following
extended
           functionalities of the Universal Asynchronous Receiver Transmitter
Peripheral (UART).
            + Initialization and de-initialization functions
            + Peripheral Control functions
./Src/stm32h7xx_hal_usart.c
stm32h7xx_hal_usart.c
/**
 **********************************
 * @file
           stm32h7xx hal usart.c
 * @author MCD Application Team
 * @brief
           USART HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Universal Synchronous/Asynchronous Receiver
Transmitter
           Peripheral (USART).
 *
            + Initialization and de-initialization functions
 *
            + IO operation functions
            + Peripheral Control functions
            + Peripheral State and Error functions
./Src/stm32h7xx_hal_usart_ex.c
stm32h7xx hal usart ex.c
/**
 ************************
 * @file
            stm32h7xx hal usart ex.c
 * @author
           MCD Application Team
           Extended USART HAL module driver.
 * @brief
            This file provides firmware functions to manage the following
extended
           functionalities of the Universal Synchronous Receiver Transmitter
Peripheral (USART).
            + Peripheral Control functions
```

functionalities of the Universal Asynchronous Receiver Transmitter

```
./Src/stm32h7xx hal wwdg.c
stm32h7xx hal wwdg.c
/**
 *********************************
           stm32h7xx_hal_wwdg.c
 * @author
          MCD Application Team
   @brief
          WWDG HAL module driver.
          This file provides firmware functions to manage the following
           functionalities of the Window Watchdog (WWDG) peripheral:
           + Initialization and Configuration functions
           + IO operation functions
./Src/stm32h7xx_ll_adc.c
stm32h7xx_ll_adc.c
/**
 *******************************
 * @file
           stm32h7xx_ll_adc.c
 * @author MCD Application Team
 * @brief
          ADC LL module driver
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 **********************************
 */
./Src/stm32h7xx ll bdma.c
stm32h7xx_11_bdma.c
/**
 ****************************
 * @file
           stm32h7xx_ll_bdma.c
 * @author MCD Application Team
 * @brief
          BDMA LL module driver.
 ***********************************
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 ********************************
```

```
*/
./Src/stm32h7xx ll comp.c
stm32h7xx 11 comp.c
/**
 ***********************************
          stm32h7xx_ll_comp.c
 * @author MCD Application Team
 * @brief
          COMP LL module driver
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx ll crc.c
stm32h7xx_ll_crc.c
/**
 *********************************
 * @file
          stm32h7xx ll crc.c
 * @author MCD Application Team
 * @brief
          CRC LL module driver.
 **********************************
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 *******************************
./Src/stm32h7xx 11 crs.c
stm32h7xx_ll_crs.c
/**
 ***********************************
 * @file
          stm32h7xx_ll_crs.h
 * @author MCD Application Team
 * @brief
          CRS LL module driver.
 ************************************
 * @attention
```

```
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 *********************************
./Src/stm32h7xx 11 dac.c
stm32h7xx_ll_dac.c
/**
 *********************************
 * @file
          stm32h7xx_ll_dac.c
 * @author MCD Application Team
  @brief
          DAC LL module driver
       *************************
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 ***********************************
./Src/stm32h7xx ll delayblock.c
stm32h7xx_ll_delayblock.c
/**
 ***********************************
  @file
          stm32h7xx_ll_delayblock.c
 * @author
          MCD Application Team
  @brief
          DelayBlock Low Layer HAL module driver.
          This file provides firmware functions to manage the following
          functionalities of the Delay Block peripheral:
           + input clock frequency range 25MHz to 208MHz
           + up to 12 oversampling phases
./Src/stm32h7xx_ll_dma.c
stm32h7xx_ll_dma.c
/**
 ******************************
 * @file
          stm32h7xx 11 dma.c
 * @author
          MCD Application Team
          DMA LL module driver.
 * @brief
 ***********************************
```

```
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 **********************************
 */
./Src/stm32h7xx_ll_dma2d.c
stm32h7xx_ll_dma2d.c
 *******************************
 * @file
          stm32h7xx_ll_dma2d.c
   @author MCD Application Team
 * @brief
          DMA2D LL module driver.
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx_ll_exti.c
stm32h7xx ll exti.c
/**
 ******************************
 * @file
          stm32h7xx ll exti.c
 * @author MCD Application Team
 * @brief
          EXTI LL module driver.
 *********************************
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 **********************************
 */
```

```
./Src/stm32h7xx_ll_fmc.c
stm32h7xx 11 fmc.c
 ***********************************
 * @file
           stm32h7xx ll fmc.c
 * @author MCD Application Team
 * @brief
           FMC Low Layer HAL module driver.
           This file provides firmware functions to manage the following
           functionalities of the Flexible Memory Controller (FMC) peripheral
memories:
            + Initialization/de-initialization functions
 *
            + Peripheral Control functions
            + Peripheral State functions
./Src/stm32h7xx_ll_gpio.c
stm32h7xx_ll_gpio.c
/**
 ***********************************
 * @file
           stm32h7xx ll gpio.c
 * @author MCD Application Team
           GPIO LL module driver.
 * @brief
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 ***********************************
 */
./Src/stm32h7xx ll hrtim.c
stm32h7xx_ll_hrtim.c
/**
 *************************
 * @file
           stm32h7xx ll hrtim.c
 * @author MCD Application Team
           HRTIM LL module driver.
 * @attention
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```

```
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 ********************************
 */
./Src/stm32h7xx ll i2c.c
stm32h7xx_ll_i2c.c
/**
 **********************************
          stm32h7xx ll i2c.c
 * @author MCD Application Team
   @brief
          I2C LL module driver.
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 **********************************
 */
./Src/stm32h7xx ll lptim.c
stm32h7xx_ll_lptim.c
/**
 ***********************************
          stm32h7xx_ll_lptim.c
 * @author MCD Application Team
          LPTIM LL module driver.
 ***********************************
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 ******************************
 */
./Src/stm32h7xx_ll_lpuart.c
stm32h7xx_ll_lpuart.c
/**
 *********************************
          stm32h7xx ll lpuart.c
 * @author MCD Application Team
          LPUART LL module driver.
 * @brief
```

```
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 ***********************************
 */
./Src/stm32h7xx_ll_mdma.c
stm32h7xx ll mdma.c
/**
 *******************************
 * @file
           stm32h7xx_ll_mdma.c
 * @author MCD Application Team
 * @brief
          MDMA LL module driver.
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 **********************************
 */
./Src/stm32h7xx ll opamp.c
stm32h7xx_11_opamp.c
/**
 **************************
 * @file
          stm32h7xx_ll_opamp.c
 * @author MCD Application Team
 * @brief
          OPAMP LL module driver
 ***********************************
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 ********************************
```

```
*/
./Src/stm32h7xx ll pwr.c
stm32h7xx ll pwr.c
/**
 ***********************************
          stm32h7xx_ll_pwr.c
 * @author MCD Application Team
 * @brief
          PWR LL module driver.
 ***********************************
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 ***********************************
 */
./Src/stm32h7xx ll rcc.c
stm32h7xx_ll_rcc.c
/**
 *********************************
 * @file
          stm32h7xx ll rcc.c
 * @author MCD Application Team
 * @brief
          RCC LL module driver.
 ***********************************
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 *******************************
./Src/stm32h7xx 11 rng.c
stm32h7xx_ll_rng.c
/**
 ***********************************
 * @file
          stm32h7xx_ll_rng.c
 * @author MCD Application Team
 * @brief
          RNG LL module driver.
 ************************************
 * @attention
```

```
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 *********************************
./Src/stm32h7xx 11 rtc.c
stm32h7xx_ll_rtc.c
/**
 **********************************
 * @file
          stm32h7xx_ll_rtc.c
 * @author MCD Application Team
  @brief
          RTC LL module driver.
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 ***********************************
./Src/stm32h7xx ll sdmmc.c
stm32h7xx_ll_sdmmc.c
/**
 ***********************************
 * @file
          stm32h7xx_ll_sdmmc.c
 * @author MCD Application Team
          SDMMC Low Layer HAL module driver.
  @brief
          This file provides firmware functions to manage the following
 *
          functionalities of the SDMMC peripheral:
           + Initialization/de-initialization functions
           + I/O operation functions
           + Peripheral Control functions
           + Peripheral State functions
./Src/stm32h7xx_ll_spi.c
stm32h7xx ll spi.c
 ************************************
 * @file
          stm32h7xx ll spi.c
 * @author MCD Application Team
```

```
* @brief
          SPI LL module driver.
 ************************************
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 ***********************************
 */
./Src/stm32h7xx ll swpmi.c
stm32h7xx ll swpmi.c
 ***********************************
 * @file
          stm32h7xx_ll_swpmi.c
 * @author MCD Application Team
          SWPMI LL module driver.
 * @brief
 **********************************
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 ***********************************
 */
./Src/stm32h7xx_ll_tim.c
stm32h7xx ll tim.c
/**
 **********************************
 * @file
          stm32h7xx_ll_tim.c
 * @author MCD Application Team
 * @brief
          TIM LL module driver.
 **********************************
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```

```
*/
./Src/stm32h7xx ll usart.c
stm32h7xx ll usart.c
/**
 **********************************
 * @file
          stm32h7xx_ll_usart.c
 * @author MCD Application Team
          USART LL module driver.
 * @brief
 **********************************
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 **********************************
 */
./Src/stm32h7xx_ll_usb.c
stm32h7xx_ll_usb.c
/**
 ************************
 * @file
          stm32h7xx ll usb.c
 * @author MCD Application Team
   @brief
          USB Low Layer HAL module driver.
 *
          This file provides firmware functions to manage the following
          functionalities of the USB Peripheral Controller:
 *
           + Initialization/de-initialization functions
           + I/O operation functions
           + Peripheral Control functions
           + Peripheral State functions
./Src/stm32h7xx_ll_utils.c
stm32h7xx_ll_utils.c
/**
 *********************************
          stm32h7xx ll utils.c
 * @author MCD Application Team
          UTILS LL module driver.
   @brief
 *******************************
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 *******************************
  */
./Src/system_stm32h7xx.c
system stm32h7xx.c
  ***********************************
  * @file
           system stm32h7xx dualcore boot cm4 cm7.c
  * @author MCD Application Team
 * @brief
           CMSIS Cortex-Mx Device Peripheral Access Layer System Source File.
           This provides system initialization template function is case of
           an application using a dual core STM32H7 device where
           Cortex-M7 and Cortex-M4 boot are enabled at the FLASH option bytes
     This file provides two functions and one global variable to be called from
     user application:
        - SystemInit(): This function is called at startup just after reset and
                      before branch to main program. This call is made inside
                      the "startup_stm32h7xx.s" file.
        - SystemCoreClock variable: Contains the core clock, it can be used
                                 by the user application to setup the
SysTick
                                 timer or configure other parameters.

    SystemCoreClockUpdate(): Updates the variable SystemCoreClock and

must
                                be called whenever the core clock is changed
                                during program execution.
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  *********************************
 */
  ./fused-src/gtest/gtest.h
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//
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//
// Author: wan@google.com (Zhanyong Wan)
//
// The Google C++ Testing Framework (Google Test)
// This header file defines the public API for death tests. It is
// #included by gtest.h so a user doesn't need to include this
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./include/gtest/gtest-message.h
gtest-message.h
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// Author: wan@google.com (Zhanyong Wan)
//
// The Google C++ Testing Framework (Google Test)
// This header file defines the Message class.
//
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gtest-param-test.h
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//
// Authors: vladl@google.com (Vlad Losev)
// Macros and functions for implementing parameterized tests
// in Google C++ Testing Framework (Google Test)
//
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gtest-spi.h
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//
// Author: wan@google.com (Zhanyong Wan)
// Utilities for testing Google Test itself and code that uses Google Test
// (e.g. frameworks built on top of Google Test).
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gtest-test-part.h
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// Author: mheule@google.com (Markus Heule)
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gtest-typed-test.h
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//
// Author: wan@google.com (Zhanyong Wan)
// Google C++ Testing Framework definitions useful in production code.
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// Authors: wan@google.com (Zhanyong Wan), eefacm@gmail.com (Sean Mcafee)
//
// The Google C++ Testing Framework (Google Test)
// This header file defines internal utilities needed for implementing
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// Author: keith.ray@gmail.com (Keith Ray)
// Google Test filepath utilities
//
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// Authors: wan@google.com (Zhanyong Wan), eefacm@gmail.com (Sean Mcafee)
//
// The Google C++ Testing Framework (Google Test)
//
// This header file declares functions and macros used internally by
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//
// Authors: Dan Egnor (egnor@google.com)
//
// A "smart" pointer type with reference tracking. Every pointer to a
// particular object is kept on a circular linked list. When the last pointer
// to an object is destroyed or reassigned, the object is deleted.
//
// Used properly, this deletes the object when the last reference goes away.
// There are several caveats:
// - Like all reference counting schemes, cycles lead to leaks.
// - Each smart pointer is actually two pointers (8 bytes instead of 4).
// - Every time a pointer is assigned, the entire list of pointers to that
    object is traversed. This class is therefore NOT SUITABLE when there
//
     will often be more than two or three pointers to a particular object.
// - References are only tracked as long as linked ptr<> objects are copied.
//
    If a linked_ptr<> is converted to a raw pointer and back, BAD THINGS
     will happen (double deletion).
//
```

```
//
// A good use of this class is storing object references in STL containers.
// You can safely put linked ptr<> in a vector<>.
// Other uses may not be as good.
// Note: If you use an incomplete type with linked_ptr<>, the class
// *containing* linked_ptr<> must have a constructor and destructor (even
// if they do nothing!).
//
// Bill Gibbons suggested we use something like this.
//
// Thread Safety:
     Unlike other linked ptr implementations, in this implementation
//
//
     a linked_ptr object is thread-safe in the sense that:
       - it's safe to copy linked_ptr objects concurrently,
//
//
       - it's safe to copy *from* a linked_ptr and read its underlying
//
         raw pointer (e.g. via get()) concurrently, and
//
       - it's safe to write to two linked_ptrs that point to the same
//
         shared object concurrently.
// TODO(wan@google.com): rename this to safe_linked_ptr to avoid
// confusion with normal linked ptr.
./include/gtest/internal/gtest-param-util-generated.h
gtest-param-util-generated.h
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// Authors: wan@google.com (Zhanyong Wan)
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//
// This file is fundamental to Google Test. All other Google Test source
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gtest-string.h
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//
// Authors: wan@google.com (Zhanyong Wan), eefacm@gmail.com (Sean Mcafee)
// The Google C++ Testing Framework (Google Test)
//
// This header file declares the String class and functions used internally by
// Google Test. They are subject to change without notice. They should not used
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//
// This header file is #included by <gtest/internal/gtest-internal.h>.
// It should not be #included by other files.
./include/gtest/internal/gtest-tuple.h
gtest-tuple.h
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// Author: wan@google.com (Zhanyong Wan)
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// Authors: vladl@google.com (Vlad Losev)
// The Google C++ Testing Framework (Google Test)
// This header file provides classes and functions used internally
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./test/gtest-typed-test_test.h
gtest-typed-test test.h
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//
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// Google Test - FrameworkSample
// widget.h
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