

STM32 CubeExpansion

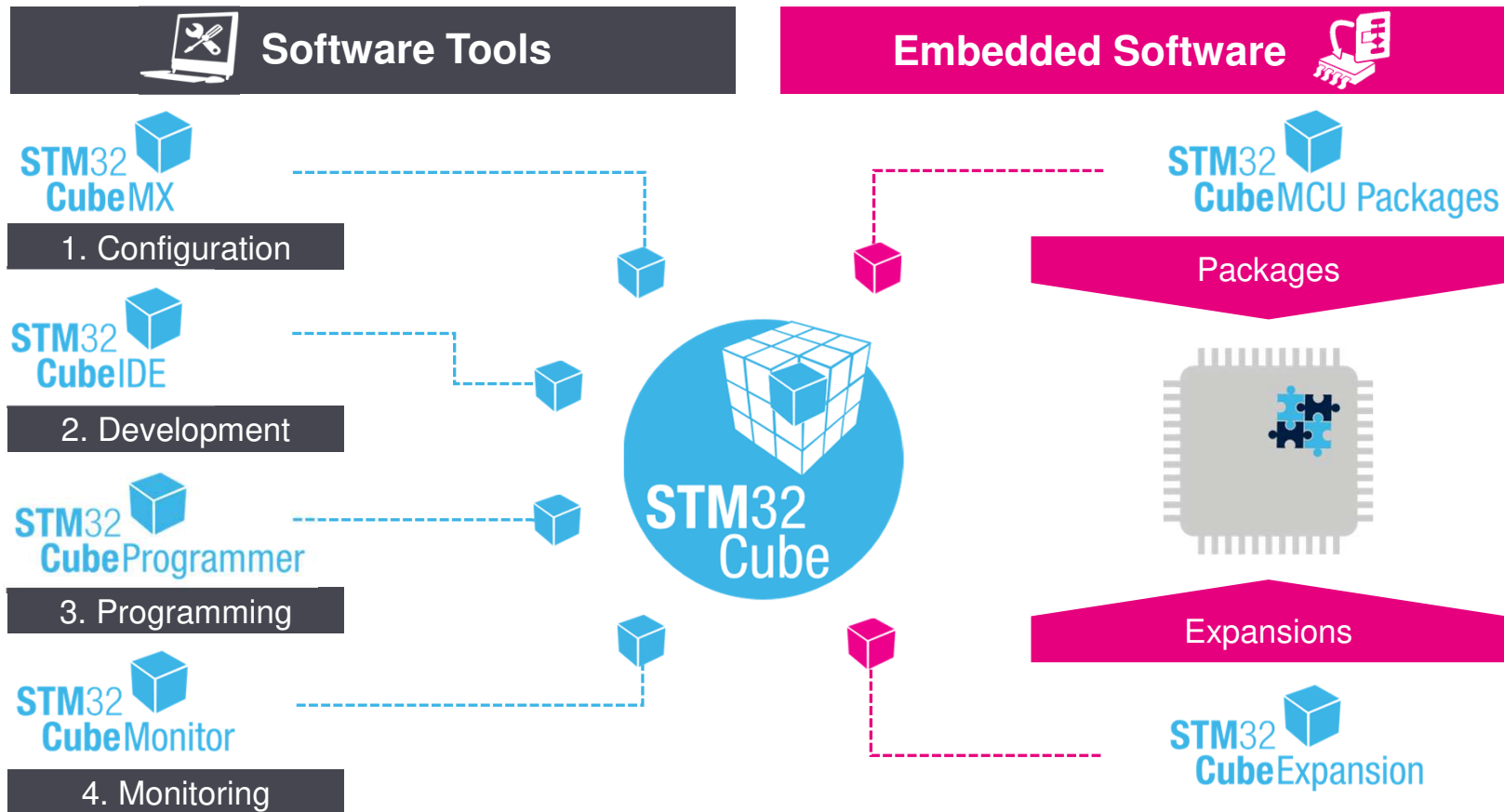


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Getting started with X-Cube-Compiler



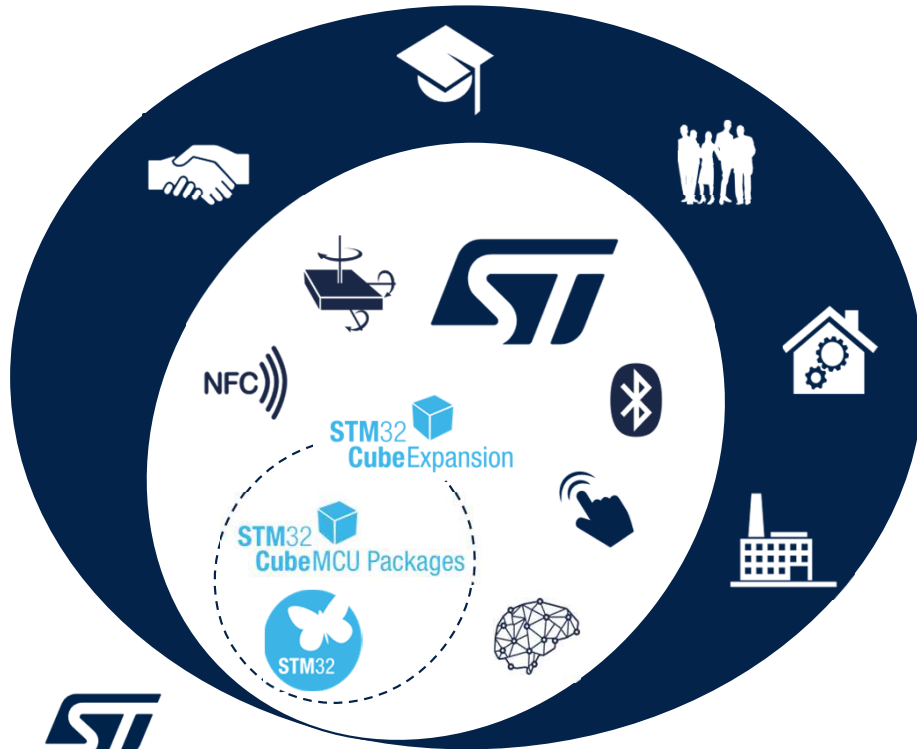
STM32Cube : a complete software ecosystem





STM32Cube embedded software ecosystem

STM32CubeExpansion : grow your Software ecosystem



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Extend the STM32 ecosystem with

- ▶ overall ST components
- ▶ ST partners offers



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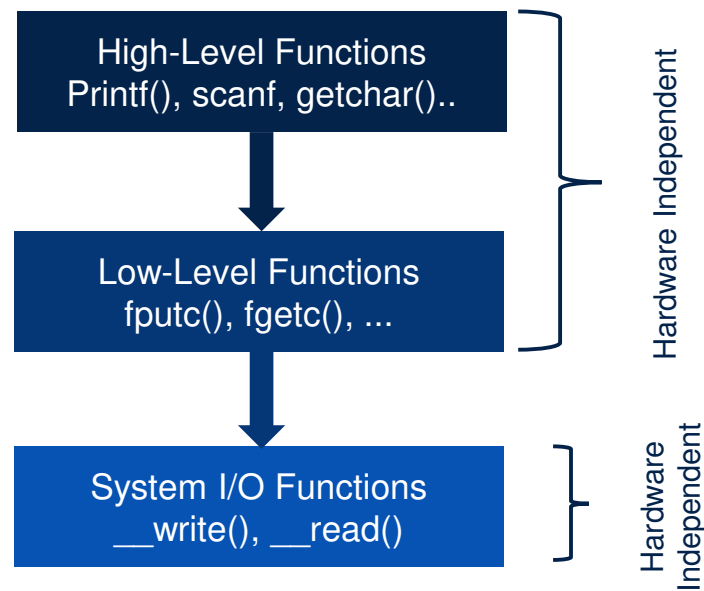
I-CUBE-STDIO Pack Details

What is I-CUBE-STDIO

- Application code frequently uses standard I/O library functions, such as `printf()`, `scanf()`, or `fgetc()` to perform input/output operations.
- The I/O library functions can be redirected to use different channels (peripheral) depending on the hardware and the application needs.
- The most common channels used for STDIN (`scanf`, `getchar`) and STDOUT (`printf`) are UART and USB Device Virtual Com Port class. STDIN could retrieve data from a USB keyboard using the USB Host HID class.
- The X-CUBE-Compiler allows you to easily retarget the I/O library to the channels listed above. The channels can be independently selected for STDOUT and STDIN. For example STDIN can retrieve data from USB Keyboard and STDOUT can redirect to a USART.

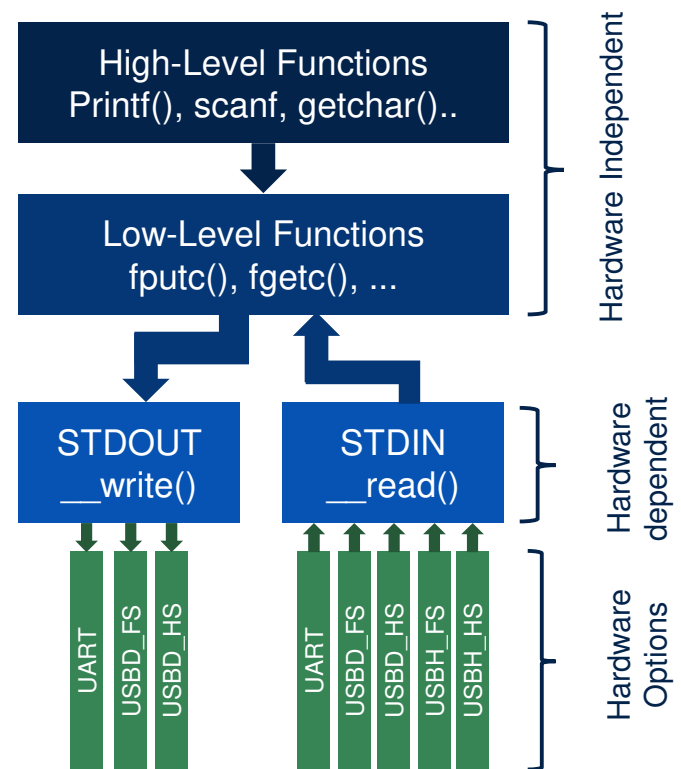
Library Structure

- Application code frequently uses standard I/O library functions, such as `printf()`, `scanf()`, or `fgetc()` to perform input/output operations.



Possible Channels

- The STDIO is formed of 3 subcomponents:
 - STDIN: Standard input is a stream from which a program reads its input data.
 - STDOUT: Standard output is a stream to which a program writes its output data.
 - STDERR: Standard error is another output stream typically used by programs to output error messages or diagnostics. For this pack, STDERR use the same stream as STDOUT



Challenges

- Not everyone know how to retarget STDIO,
- Different implementation between projects,
- The use of the USB Device or USB Host is not that simple,
- Changing one application from using UART to use USB or vise versa can be difficult and time consuming,
- Each compiler is lightly different than the other,

Goal

- The goal of the pack is:
 - Make it easy for the developer to use and retarget STDIO in his application,
 - Make it easy for the developers to change from one channel to another,
 - Make it easy to use USB Device and Host in the application,
 - Save time for the developer,
 - Not worry about which compiler being used,
 - Make switching the application from one hardware to another as easy as possible,
 - Use STM32CubeMX to:
 - Include the proper files in the project
 - Configure the channels being used
 - Solve any peripherals conflict

Software Components

- The Package will have a dedicated file for each channel.
 - We have 3 channels for STDIN (USART, USBD_FS and USBD_HS)
 - We have 5 channels for STDOUT (USART, USBD_FS, USBD_HS, USBH_FS and USBH_HS)

```
stdin_usart.c
stdin_usbd_cdc_fs.c
stdin_usbd_cdc_hs.c
stdin_usbh_hid_fs.c
stdin_usbh_hid_hs.c
stdout_usart.c
stdout_usbd_cdc_fs.c
stdout_usbd_cdc_hs.c
```

- The PDSC file will be used to select the proper file depending on the user selection. This will be achieved using a bundle that contains two subgroups (STDIN and STDOUT). STDIN will contain 5 variants and STDOUT will contain 3 variant. (one variant for each channel)

Connect the Channels to the Peripheral

- Each of the pack files requires a handler to the peripheral that should be used for that specific channel.
 - Example: The `stdin_usart.c` and `stdout_usart.c` requires the handler for a USART.
- STM32CubeMX will be used to associate the proper handlers to the proper stream.

```
C stdin_usbh_hid_hs.c C stdout_usart.c X
C stdout_usart.c > [?] STDOUT_UART_HANDLER
19
20 #include "main.h"
21 #include "STM32CubeMX.Compiler_conf.h"
22 #include <stdio.h>
23
24 extern UART_HandleTypeDef STDOUT_UART_HANDLER;
25
26 #ifdef __ICCARM__
27 int _write(int file, char *ptr, int len)
28 #else
29 int _write(int file, char *ptr, int len)
30 #endif
31 {
32     HAL_UART_Transmit(&STDOUT_UART_HANDLER, (uint8_t *)ptr, len, 0xFFFFFFFF);
33     return len;
34 }
35
36
```

File	Handler name	Possible Value(s)
		USART1=huart1 USART2=huart2 USART3=huart3 LPUART1=hlpuart1
stdin_usart.c	STDIN_UART_HANDLER	
stdin_usbd_cdc_fs.c	STDIN_USBD_FS_HANDLER	hUsbDeviceFS
stdin_usbd_cdc_hs.c	STDIN_USBD_HS_HANDLER	hUsbDeviceHS
stdin_usbh_hid_fs.c	STDIN_USBH_FS_HANDLER	hUsbHostFS
stdin_usbh_hid_hs.c	STDIN_USBH_HS_HANDLER	hUsbHostHS
		USART1=huart1 USART2=huart2 USART3=huart3 LPUART1=hlpuart1
stdout_usart.c	STDOUT_UART_HANDLER	
stdout_usbd_cdc_fs.c	STDOUT_USBD_FS_HANDLER	hUsbDeviceFS
stdout_usbd_cdc_hs.c	STDOUT_USBD_HS_HANDLER	hUsbDeviceHS

X-CUBE-STDIO pdsc Components

- The PDSC file will be structured as following
 - One bundle called STDIO, Class Compiler
 - Inside the bundle we have 8 components in the I O Group

Element	Name	Bundle	Class	Group	Subgroup	Variant	Condition	Description	File
Bundle	STDIO		Compiler					Retarget I/O functions of the standard C run-time library to different channels (UART/USB Device/USB Host)	
Component		STDIO	Compiler	I O	STDIN	USART		Retrieve STDIN from USART	stdin_usart.c
Component		STDIO	Compiler	I O	STDIN	USB_D_CDC_FS		Retrieve STDIN from USB Device Full Speed Virtual Com Port	stdin_usbd_cdc_fs.c
Component		STDIO	Compiler	I O	STDIN	USB_D_CDC_HS		Retrieve STDIN from USB Device High Speed Virtual Com Port	stdin_usbd_cdc_hs.c
Component		STDIO	Compiler	I O	STDIN	USBH_HID_FS	STDOUT_USB_D_FS_NOT_SELECTED	Retrieve STDIN from a Keyboard using USB Host Full Speed HID	stdin_usbh_hid_fs.c
Component		STDIO	Compiler	I O	STDIN	USBH_HID_FS	STDOUT_USB_D_HS_NOT_SELECTED	Retrieve STDIN from a Keyboard using USB Host High Speed HID	stdin_usbh_hid_hs.c
Component		STDIO	Compiler	I O	STDOUT	USART		Redirect STDOUT to USART	stdout_usart.c
Component		STDIO	Compiler	I O	STDOUT	USB_D_CDC_FS	STDIN_USBH_FS_NOT_SELECTED	Redirect STDOUT to USB Device Full Speed Virtual Com Port	stdout_usbd_cdc_fs.c
Component		STDIO	Compiler	I O	STDOUT	USB_D_CDC_HS	STDIN_USBH_HS_NOT_SELECTED	Redirect STDOUT to USB Device High Speed Virtual Com Port	stdout_usbd_cdc_hs.c

X-CUBE-STDIO pdsc Conditions

- The channels can be independently selected for STDOUT and STDIN. For example STDIN can retrieve data from USB Keyboard while STDOUT redirected to USART. However there are some restrictions:
 - You **cannot** select
 - USBH_FS for STDIN and SUBD_FS for STDOUT.
 - USBH_HS for STDIN and SUBD_FS for STDOUT.
 - You can:
 - USBD_FS for STDIN and SUBD_FS for STDOUT.
 - USBD_HS for STDIN and SUBD_HS for STDOUT.

Condition Name	Usage
STDOUT_USBD_FS_NOT_SELECTED	Prevent STDIN from selecting USBD FS when USBH_HID_FS is selected for STDOUT
STDOUT_USBD_HS_NOT_SELECTED	Prevent STDIN from selecting USBD HS when USBH_HID_HS is selected for STDOUT
STDIN_USBH_FS_NOT_SELECTED	Prevent STDOUT from selecting USBH FS when USBD_CDC_FS is selected for STDIN
STDIN_USBH_HS_NOT_SELECTED	Prevent STDOUT from selecting USBH HS when USBD_CDC_HS is selected for STDIN

X-CUBE-STDIO pdsc Files

- Each component/variant in the pdsc file will require to connect the retargeting function to the correct peripheral handler
- These requirements are going to be configured using STM32CubeMX advanced features

File name	Description	Requirement
stdin_usart.c	Use UART for STDIN	A handler to a USART
stdin_usbd_cdc_fs.c	Use USB D FS CDC class for STDIN	A handler to a USB interface
stdin_usbd_cdc_hs.c	Use USB D HS CDC class for STDIN	A handler to a USB interface
stdin_usbh_hid_fs.c	Use USB H FS HID class for STDIN (Keyboard)	A handler to a USB interface
stdin_usbh_hid_hs.c	Use USB H HS HID class for STDIN (Keyboard)	A handler to a USB interface
stdout_usart.c	Use UART for STDOUT	A handler to a USART
stdout_usbd_cdc_fs.c	Use USB D FS CDC class for STDOUT	A handler to a USB interface
stdout_usbd_cdc_hs.c	Use USB D HS CDC class for STDOUT	A handler to a USB interface

X-CUBE-STDIO Components Requirements

- The X-CUBE-STDIO files require the following handlers

File	Handler name	Possible Value(s)
stdin_usart.c	STDIN_UART_HANDLER	USART1=huart1 USART2=huart2 USART3=huart3 LPUART1=hlpuart1
stdin_usbd_cdc_fs.c	STDIN_USBD_FS_HANDLER	hUsbDeviceFS
stdin_usbd_cdc_hs.c	STDIN_USBD_HS_HANDLER	hUsbDeviceHS
stdin_usbh_hid_fs.c	STDIN_USBH_FS_HANDLER	hUsbHostFS
stdin_usbh_hid_hs.c	STDIN_USBH_HS_HANDLER	hUsbHostHS
stdout_usart.c	STDOUT_UART_HANDLER	USART1=huart1 USART2=huart2 USART3=huart3 LPUART1=hlpuart1
stdout_usbd_cdc_fs.c	STDOUT_USBD_FS_HANDLER	hUsbDeviceFS
stdout_usbd_cdc_hs.c	STDOUT_USBD_HS_HANDLER	hUsbDeviceHS

X-CUBE-Compiler Parameters Conditions

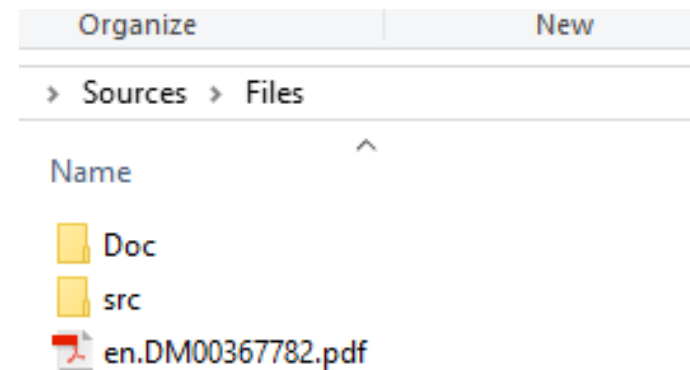
- STM32CubeMX will display the specific parameters with the following conditions:

Parameter name	Condition	Description
STDIN_UART_HANDLER	STDIN_USART_SELECTED	USART is selected for STDIN
STDIN_USBD_FS_HANDLER	STDIN_USBD_FS_SELECTED	USBD_FS is selected for STDIN
STDIN_USBD_HS_HANDLER	STDIN_USBD_HS_SELECTED	USBD_HS is selected for STDIN
STDIN_USBH_FS_HANDLER	STDIN_USBH_FS_SELECTED	USBH_FS is selected for STDIN
STDIN_USBH_HS_HANDLER	STDIN_USBH_HS_SELECTED	USBH_HS is selected for STDIN
STDOUT_UART_HANDLER	STDOUT_USART_SELECTED	USART is selected for STDOUT
STDOUT_USBD_FS_HANDLER	STDOUT_USBD_FS_SELECTED	USBD_FS is selected for STDOUT
STDOUT_USBD_HS_HANDLER	STDOUT_USBD_HS_SELECTED	USBD_HS is selected for STDOUT

X-CUBE-STDIO Pack Creation

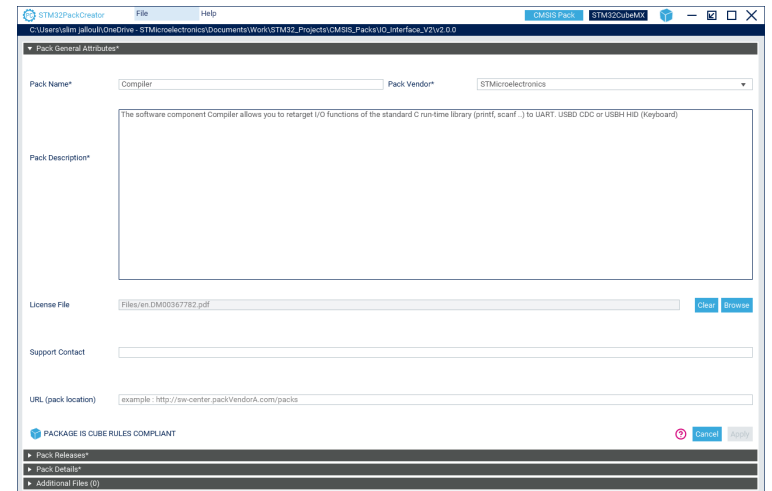
Files Location

- All Files are located under `..\Source\Files`
 - Doc: Directory contains the pack documentation
 - Src: Directory contains the source files
 - en.DM00367782.pdf: License file



Create New Pack

- Pack Name: X-CUBE-STDIO
- Pack Vendor: STMicroelectronics
- Description: “The software component Compiler allows you to retarget I/O functions of the standard C run-time library (printf, scanf ..) to UART. USBD CDC or USBH HID (Keyboard)”
- License: Files/en.DM00367782.pdf



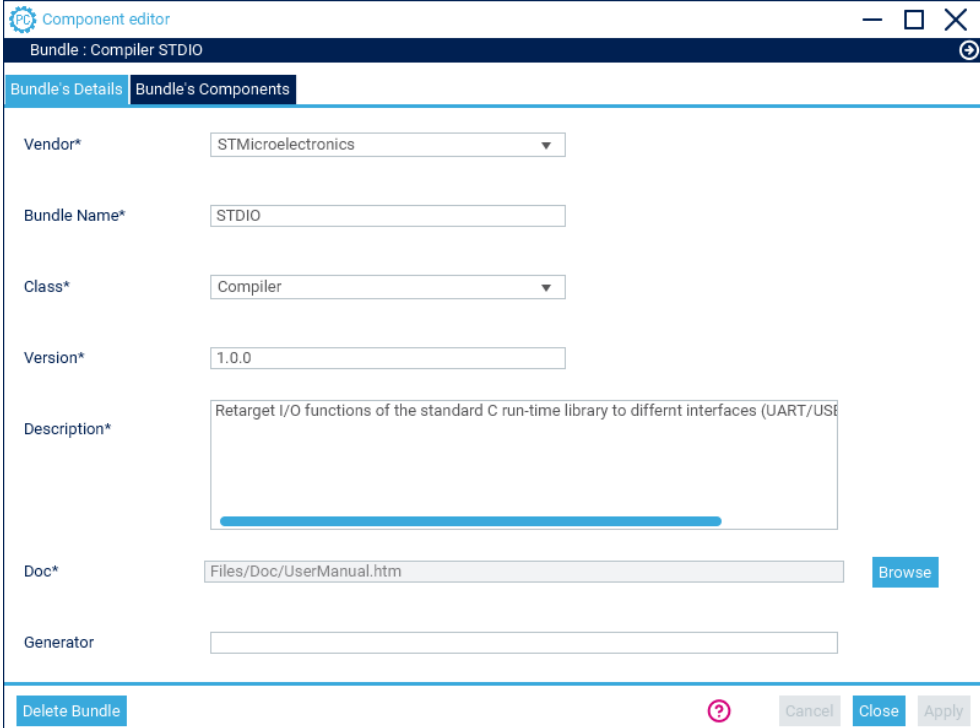
Pack Release

- Create a new version for the pack. Example 1.0.0
- Add Description: Initial release
- Add Release date

The screenshot shows the STM32PackCreator application window. The title bar includes 'STM32PackCreator', 'File', 'Help', 'CMSIS Pack', and 'STM32CubeMX'. The address bar shows the file path: 'C:\Users\slim jalloul\OneDrive - STMicroelectronics\Documents\Work\STM32_Projects\CMSIS_Packs\IO_Interface_V2\2.0.0'. The main interface has a tree view on the left with 'Pack General Attributes*', 'Pack Releases*', 'Previous Releases (0)', 'Pack Details*', and 'Additional Files (0)'. The 'Current Release*' section is expanded, showing fields for 'Version*' (2.0.0), 'Description*' (Created using PackCreator STM32PackCreator-3.0.0-A9), 'Release Date*' (2020-03-03), 'Release Tag', 'Release URL', 'Deprecated Date' (yyyy-mm-dd), and 'Replacement'. There are 'Delete', 'Edit', 'Cancel', and 'Apply' buttons at the bottom of the form.

Add a Bundle

- Add a new bundle
 - Name: STDIO
 - Class: Compiler
 - Version 1.0.0
 - **Description:** “Retarget I/O functions of the standard C run-time library to different interfaces (UART/USB Device/USB Host)”
 - **Doc:** Files/Doc/UserManual.htm



The screenshot shows the 'Component editor' window with the 'Bundle : Compiler STDIO' title. The 'Bundle's Details' tab is active, displaying the following fields:

- Vendor***: Dropdown menu set to 'STMicroelectronics'.
- Bundle Name***: Text input field containing 'STDIO'.
- Class***: Dropdown menu set to 'Compiler'.
- Version***: Text input field containing '1.0.0'.
- Description***: Text area containing the text: 'Retarget I/O functions of the standard C run-time library to different interfaces (UART/USB Device/USB Host)'.
- Doc***: Text input field containing 'Files/Doc/UserManual.htm', with a 'Browse' button to its right.
- Generator**: Empty text input field.

At the bottom of the window, there is a 'Delete Bundle' button, a help icon (question mark in a circle), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USART 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDIN
 - Variant : USART
 - Description :
 - Retrieve STDIN from USART

The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDIN - USART'. The 'Component's Details' tab is active, displaying the following fields:

- Vendor***: STMicroelectronics (dropdown)
- Bundle**: Compiler STUDIO (dropdown)
- Class***: Compiler (dropdown)
- Version***: 1.0.0 (text input)
- Group***: I O (dropdown)
- Subgroup**: STDIN (dropdown)
- Description***: Retrieve STDIN from USART (text area)
- Condition**: (empty dropdown)
- Variant**: USART (dropdown) with a checked ☐ **Default Variant**
- RTE_Components**: (empty text area)
- Max Instances**: 1 (text input)
- Api Version**: MAJOR.MINOR.PATCH[-Pre Release][+](text input)
- Generator**: (empty text input)
- ☐ **Deprecated**

At the bottom, there is a 'Delete Component' button, a help icon (?), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USART 2/2)

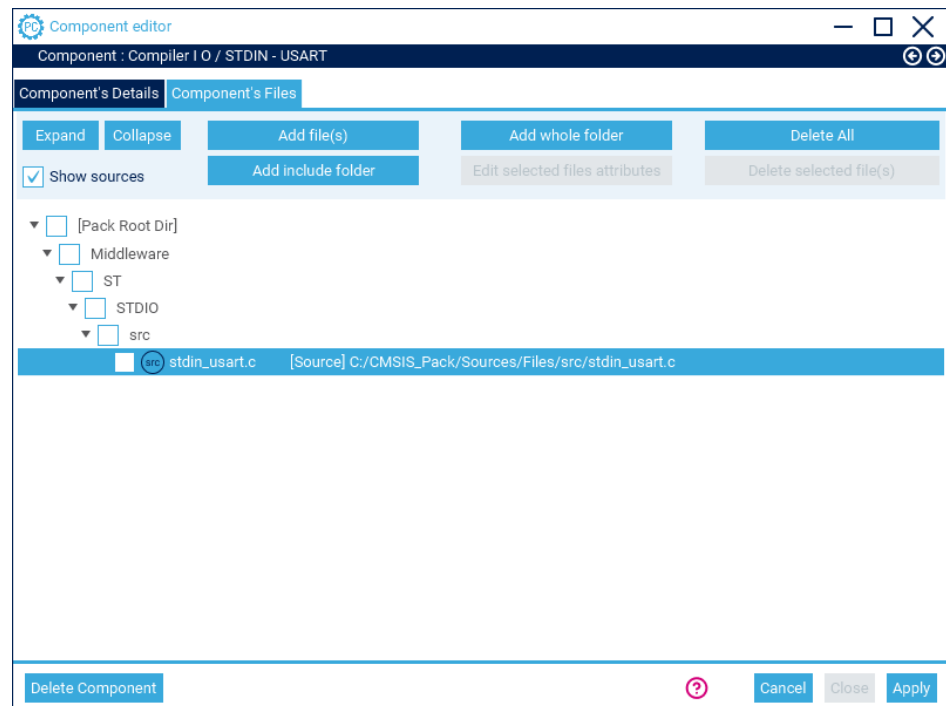
- **Select File:** `C:\CMSIS_Pack\Sources\Files\src\stdin_usart.c`
- **Set Target path:** `[Pack Root Dir]/Middleware/ST/STDIO/src`

Target path selection

Please select target path in package.

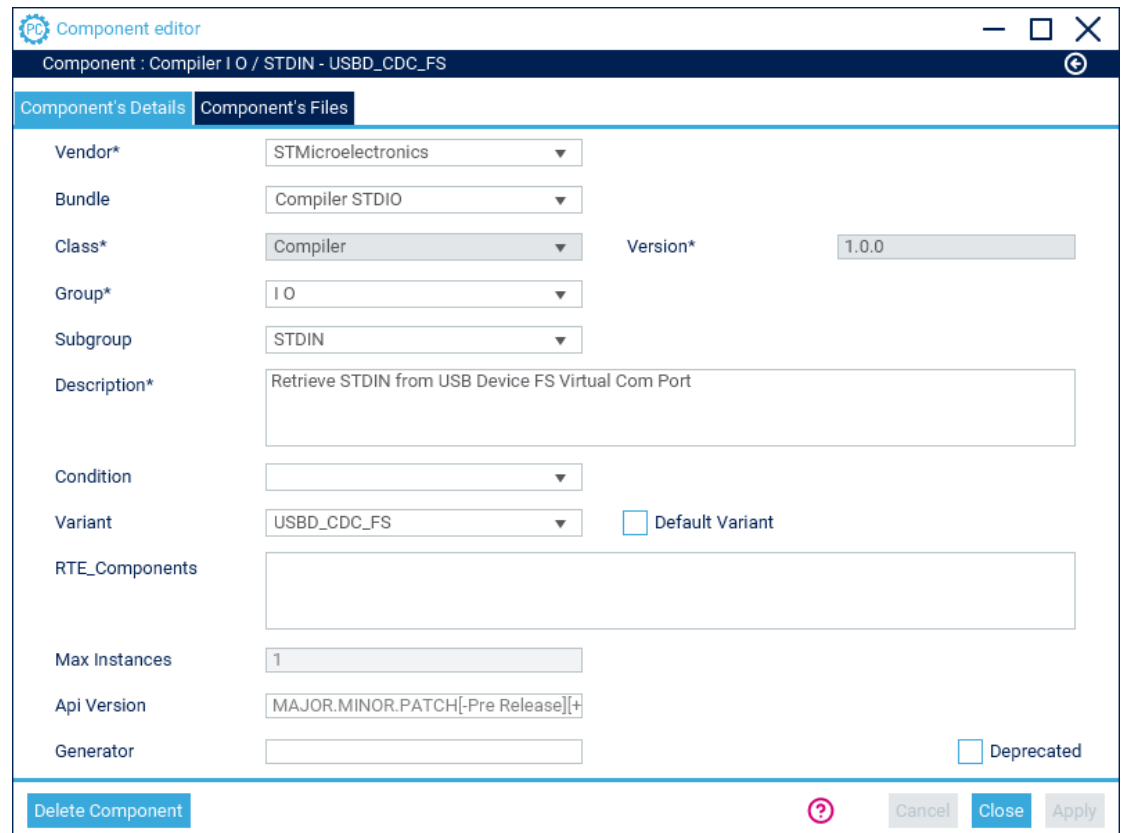
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDIN-USBD_CDC_FS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDIN
 - Variant : USBD_CDC_FS
 - Description :
 - Retrieve STDIN from USB Device FS Virtual Com Port



The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDIN - USBD_CDC_FS'. The window has two tabs: 'Component's Details' (selected) and 'Component's Files'. The 'Component's Details' tab contains the following fields:

- Vendor*: STMicroelectronics (dropdown)
- Bundle: Compiler STDIO (dropdown)
- Class*: Compiler (dropdown)
- Version*: 1.0.0 (text input)
- Group*: I O (dropdown)
- Subgroup: STDIN (dropdown)
- Description*: Retrieve STDIN from USB Device FS Virtual Com Port (text area)
- Condition: (dropdown)
- Variant: USBD_CDC_FS (dropdown) with a checkbox for 'Default Variant' (unchecked)
- RTE_Components: (empty text area)
- Max Instances: 1 (text input)
- Api Version: MAJOR.MINOR.PATCH[-Pre Release][+](text input)
- Generator: (empty text input)
- Deprecated: (checkbox, unchecked)

At the bottom of the window, there is a 'Delete Component' button, a help icon (question mark), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USBD_CDC_FS 2/2)

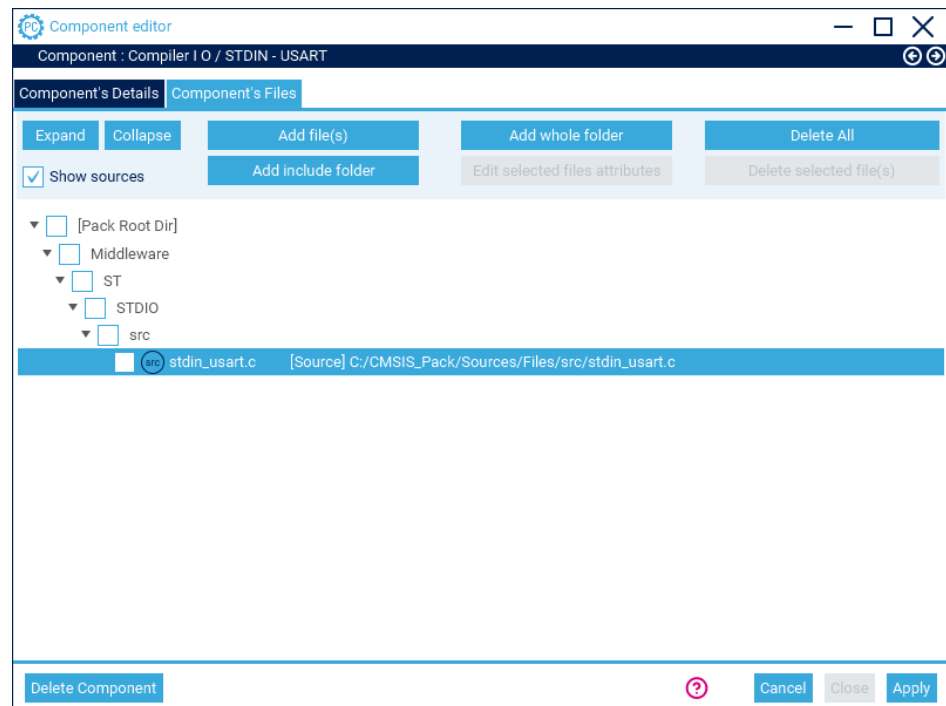
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\stdin_usbd_cdc_fs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

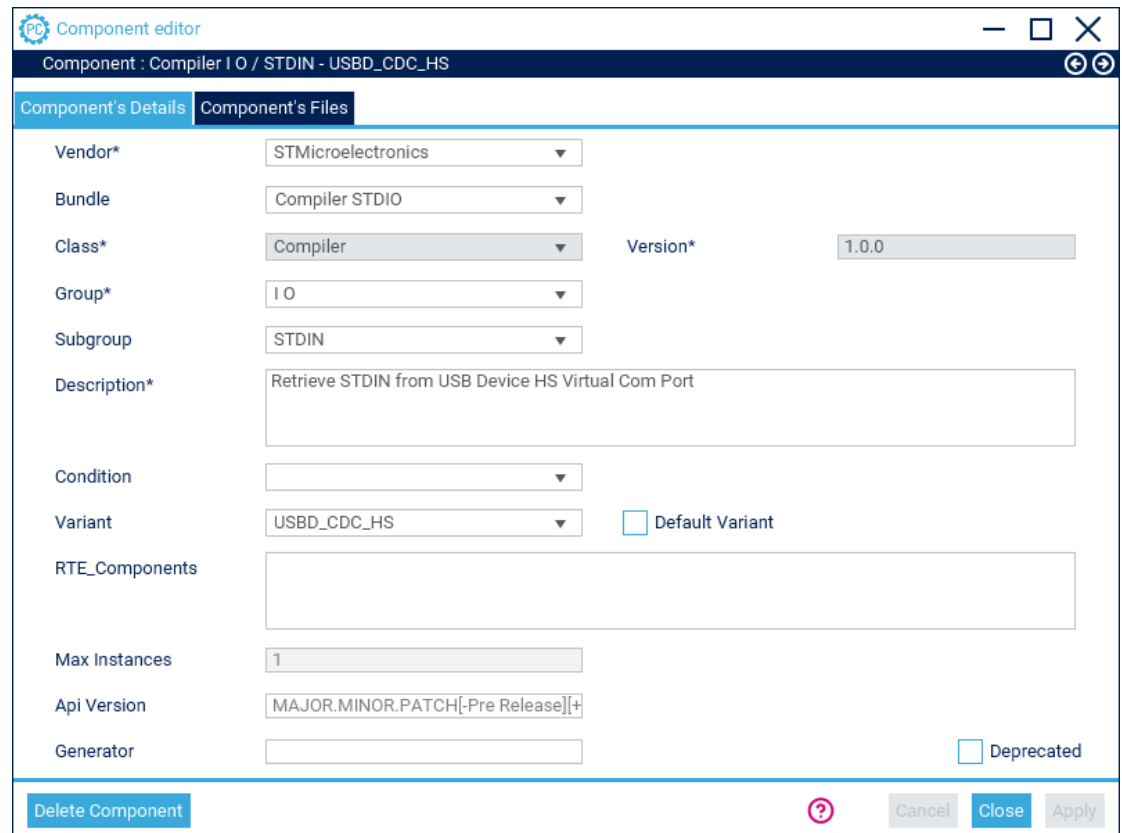
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDIN-USBD_CDC_HS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDIN
 - Variant : USBD_CDC_HS
 - Description :
 - Retrieve STDIN from USB Device HS Virtual Com Port



The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDIN - USBD_CDC_HS'. The window has two tabs: 'Component's Details' (selected) and 'Component's Files'. The 'Component's Details' tab contains the following fields:

- Vendor*: STMicroelectronics (dropdown)
- Bundle: Compiler STDIO (dropdown)
- Class*: Compiler (dropdown)
- Version*: 1.0.0 (text input)
- Group*: I O (dropdown)
- Subgroup: STDIN (dropdown)
- Description*: Retrieve STDIN from USB Device HS Virtual Com Port (text area)
- Condition: (empty dropdown)
- Variant: USBD_CDC_HS (dropdown) with a checkbox for 'Default Variant' (unchecked)
- RTE_Components: (empty text area)
- Max Instances: 1 (text input)
- Api Version: MAJOR.MINOR.PATCH[-Pre Release][+](text input)
- Generator: (empty text input)
- Deprecated: (checkbox, unchecked)

At the bottom of the window, there is a 'Delete Component' button, a help icon (question mark), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USBD_CDC_HS 2/2)

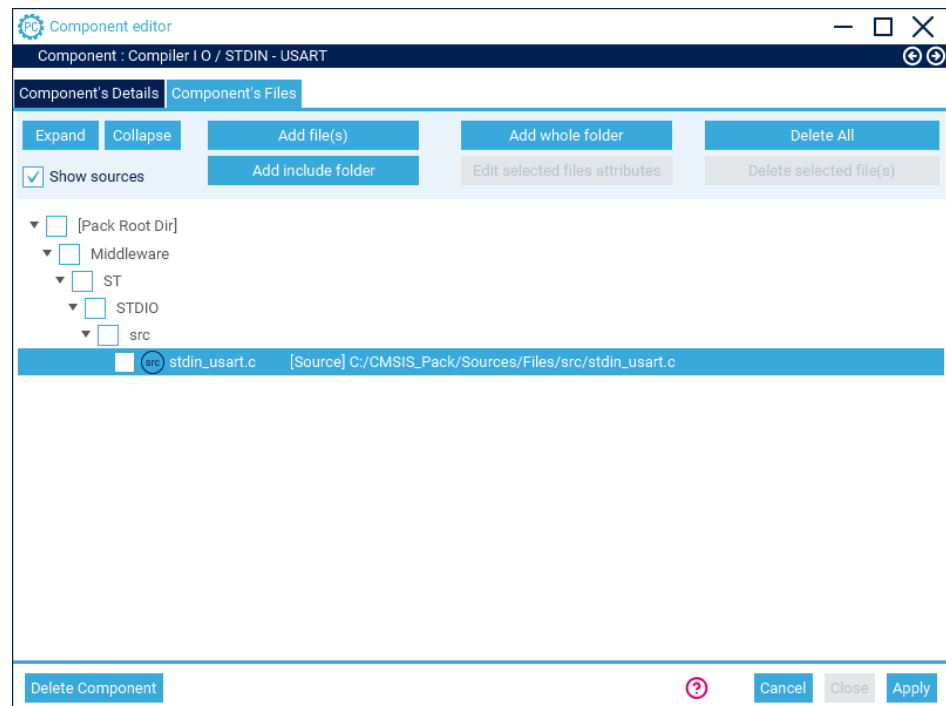
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\stdin_usbd_cdc_hs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

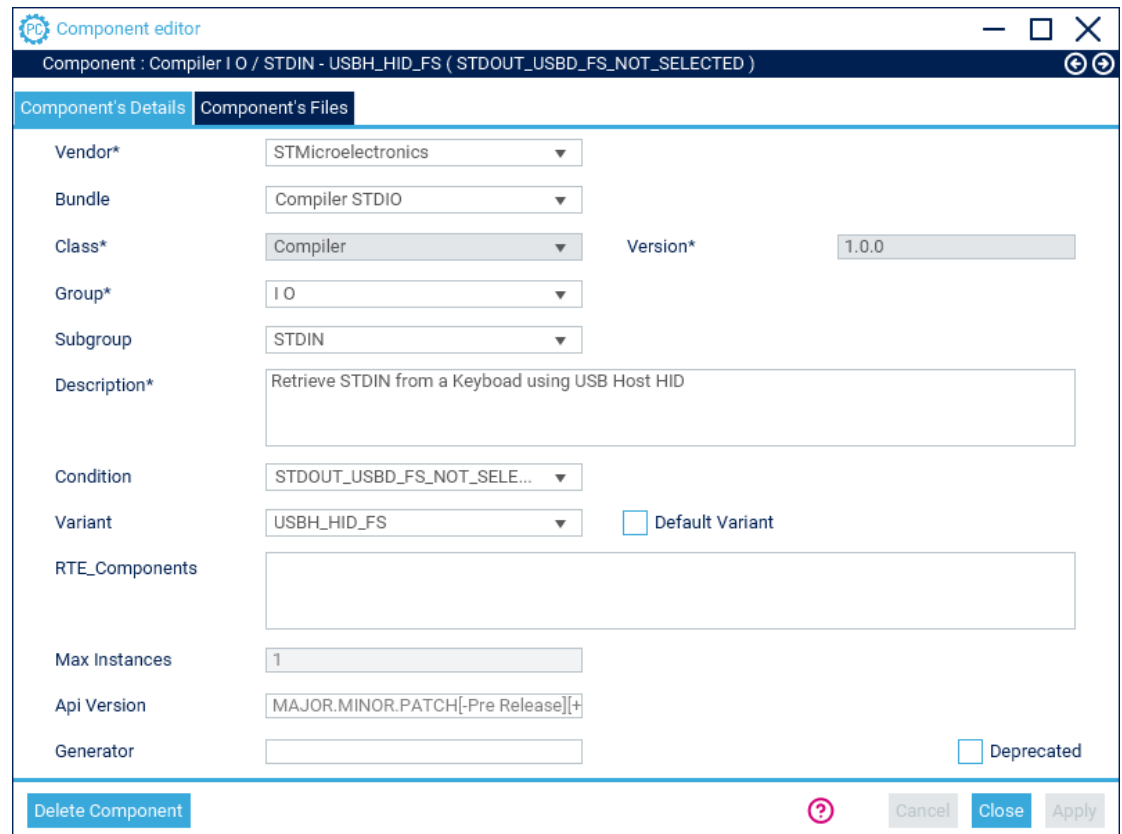
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDIN-USBD_HID_FS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDIN
 - Variant : USBD_HID_FS
 - Description :
 - Retrieve STDIN from a Keyboard using USB Host FS HID



The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDIN - USBH_HID_FS (STDOUT_USBD_FS_NOT_SELECTED)'. The window has two tabs: 'Component's Details' (selected) and 'Component's Files'. The 'Component's Details' tab contains the following fields:

- Vendor*: STMicroelectronics (dropdown)
- Bundle: Compiler STUDIO (dropdown)
- Class*: Compiler (dropdown)
- Version*: 1.0.0 (text input)
- Group*: I O (dropdown)
- Subgroup: STDIN (dropdown)
- Description*: Retrieve STDIN from a Keyboard using USB Host HID (text area)
- Condition: STDOUT_USBD_FS_NOT_SELE... (dropdown)
- Variant: USBH_HID_FS (dropdown) with a checkbox for 'Default Variant' (unchecked)
- RTE_Components: (empty text area)
- Max Instances: 1 (text input)
- Api Version: MAJOR.MINOR.PATCH[-Pre Release][+](text input)
- Generator: (empty text input)
- Deprecated: (checkbox, unchecked)

At the bottom of the window, there is a 'Delete Component' button, a help icon (?), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USBD_HID_FS 2/2)

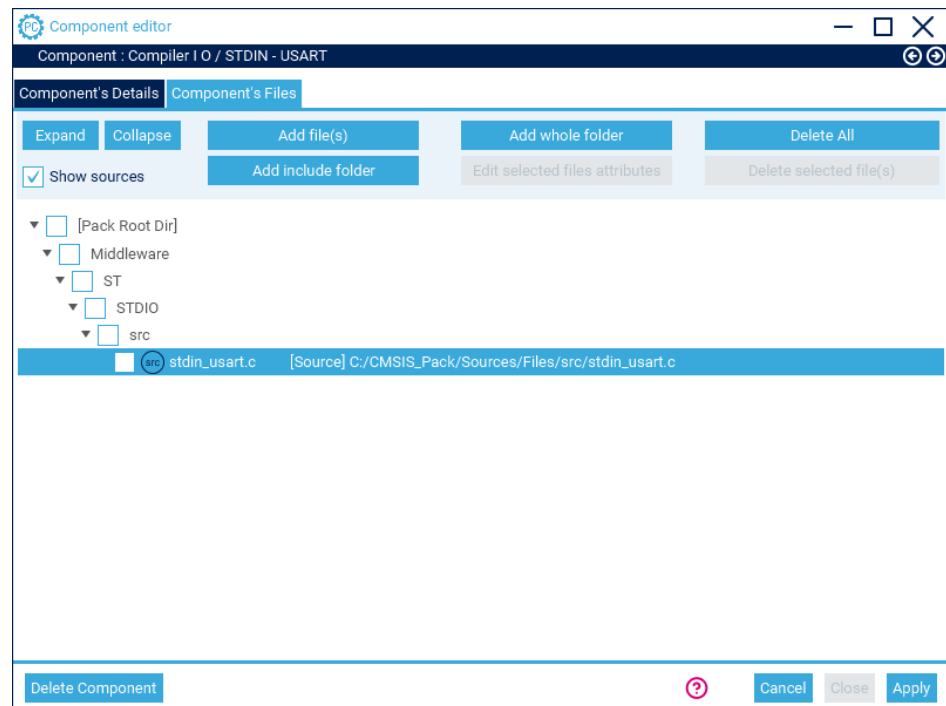
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\ stdin_usbh_hid_fs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

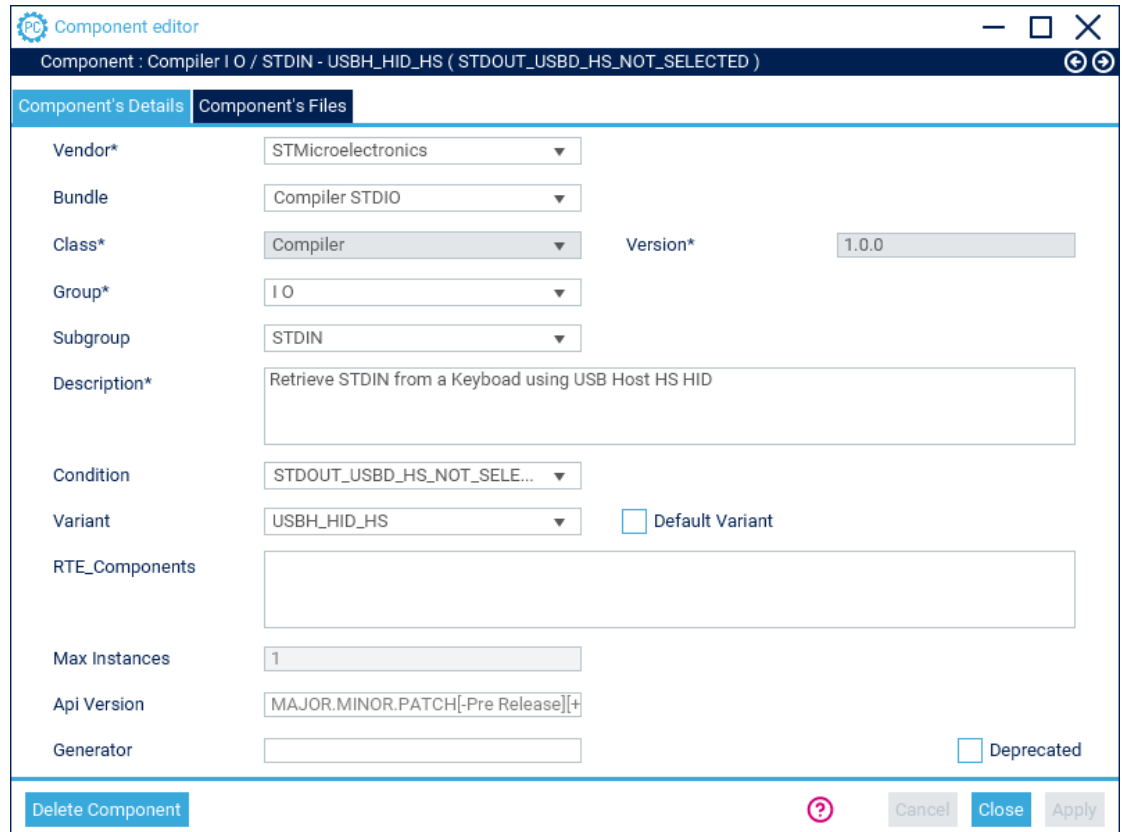
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDIN-USBD_HID_HS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDIN
 - Variant : USBD_HID_HS
 - Description :
 - Retrieve STDIN from a Keyboard using USB Host HS HID



The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDIN - USBH_HID_HS (STDOUT_USBD_HS_NOT_SELECTED)'. The 'Component's Details' tab is active, displaying the following fields:

- Vendor*: STMicroelectronics
- Bundle: Compiler STUDIO
- Class*: Compiler
- Version*: 1.0.0
- Group*: I O
- Subgroup: STDIN
- Description*: Retrieve STDIN from a Keyboard using USB Host HS HID
- Condition: STDOUT_USBD_HS_NOT_SELE...
- Variant: USBH_HID_HS ☐ Default Variant
- RTE_Components: (empty list)
- Max Instances: 1
- Api Version: MAJOR.MINOR.PATCH[-Pre Release][+]
- Generator: (empty field)
- ☐ Deprecated

At the bottom, there is a 'Delete Component' button, a help icon (?), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USBD_HID_FS 2/2)

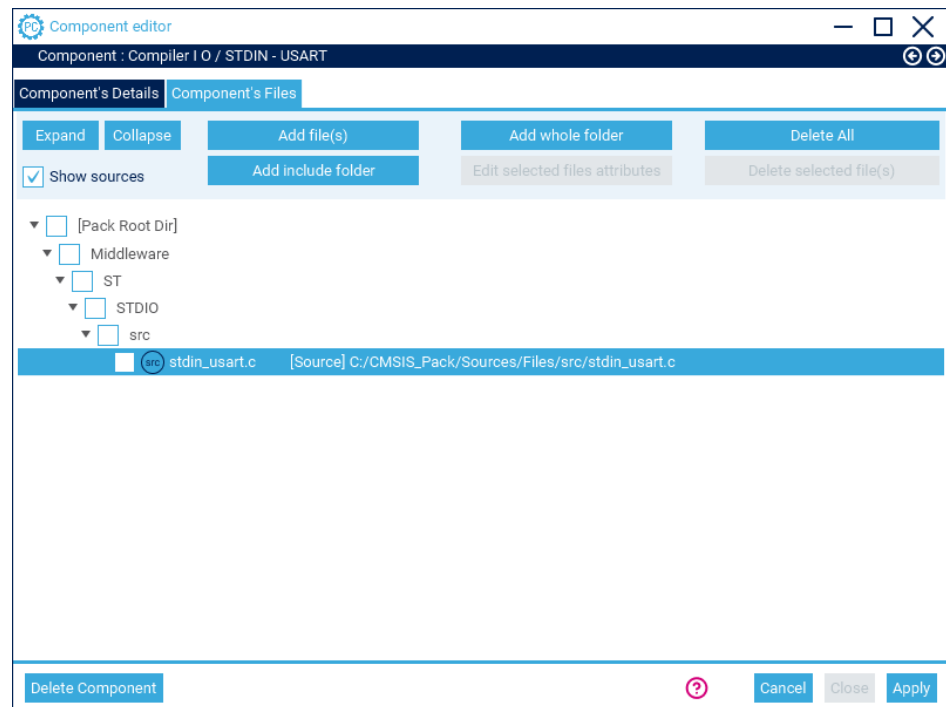
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\ stdin_usbh_hid_hs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

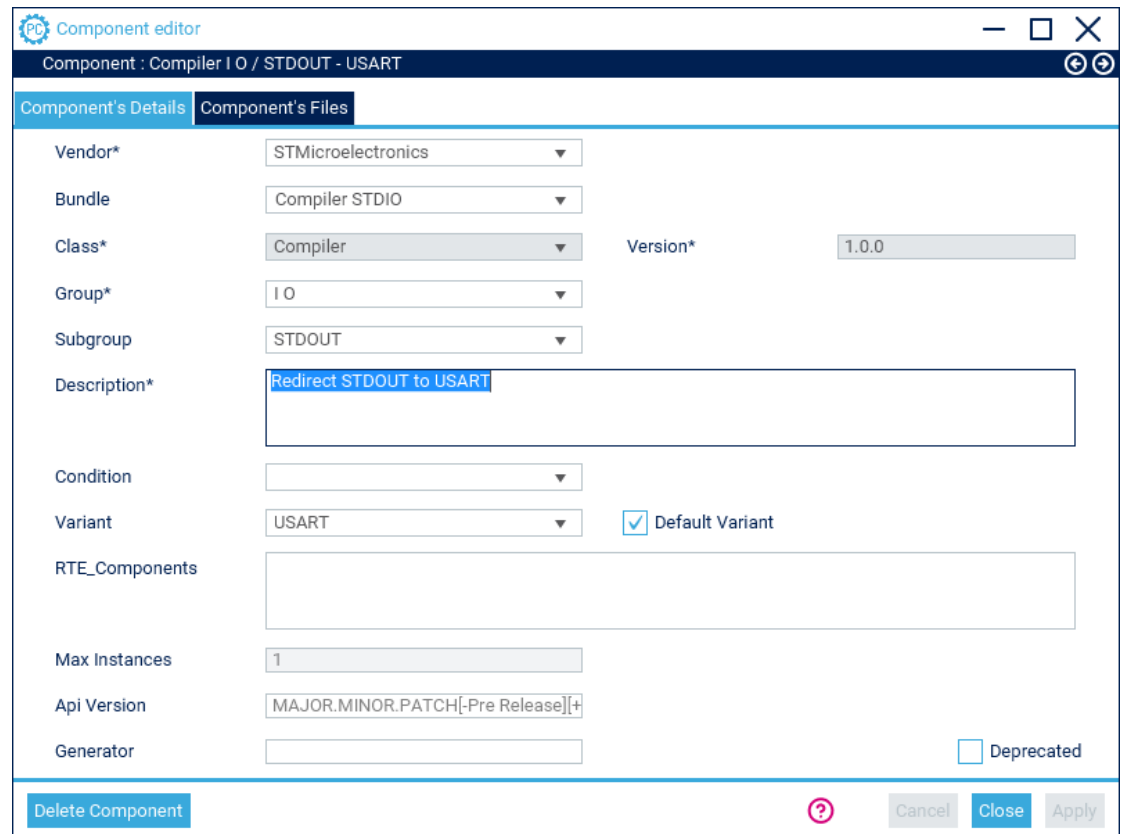
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDOUT-USART 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDOUT
 - Variant : USART
 - Description :
 - Redirect STDOUT to USART



The screenshot shows the 'Component editor' window with the title bar 'Component : Compiler I O / STDOUT - USART'. The 'Component's Details' tab is active, displaying the following fields:

- Vendor*: STMicroelectronics
- Bundle: Compiler STUDIO
- Class*: Compiler
- Version*: 1.0.0
- Group*: I O
- Subgroup: STDOUT
- Description*: Redirect STDOUT to USART
- Condition: (empty dropdown)
- Variant: USART ☒ Default Variant
- RTE_Components: (empty text area)
- Max Instances: 1
- Api Version: MAJOR.MINOR.PATCH[-Pre Release][+]
- Generator: (empty text field)
- ☐ Deprecated

At the bottom, there is a 'Delete Component' button, a help icon (?), and 'Cancel', 'Close', and 'Apply' buttons.

Add Component (STDIN-USART 2/2)

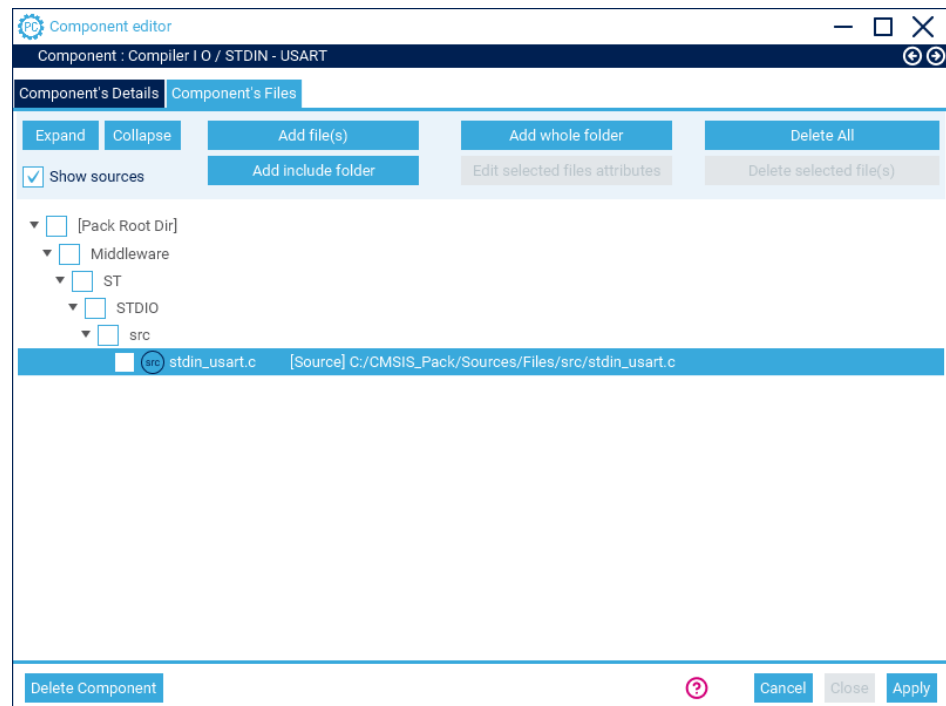
- **Select File:** C : \CMSIS_Pack\Sources\Files\src\stdout_usart.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDOUT-USBD_CDC_FS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDOUT
 - Variant : USBD_CDC_FS
 - Description :
 - Redirect STDOUT to USB Device Full Speed Virtual Com Port class

The screenshot shows the 'Component editor' window with the following configuration:

- Component:** Compiler I O / STDOUT - USBD_CDC_FS (STDIN_USBH_FS_NOT_SELECTED)
- Component's Details:**
 - Vendor*:** STMicroelectronics
 - Bundle:** Compiler STUDIO
 - Class*:** Compiler
 - Version*:** 1.0.0
 - Group*:** I O
 - Subgroup:** STDOUT
 - Description*:** Redirect STDOUT to USB Device Full Speed Virtual Com Port class
 - Condition:** STDIN_USBH_FS_NOT_SELEC...
 - Variant:** USBD_CDC_FS ☐ Default Variant
 - RTE_Components:** (Empty list)
 - Max Instances:** 1
 - Api Version:** MAJOR.MINOR.PATCH[-Pre Release][+]
 - Generator:** (Empty field)
- Buttons:** Delete Component, ? (Help), Cancel, Close, Apply

Add Component (STDIN-USBD_CDC_FS 2/2)

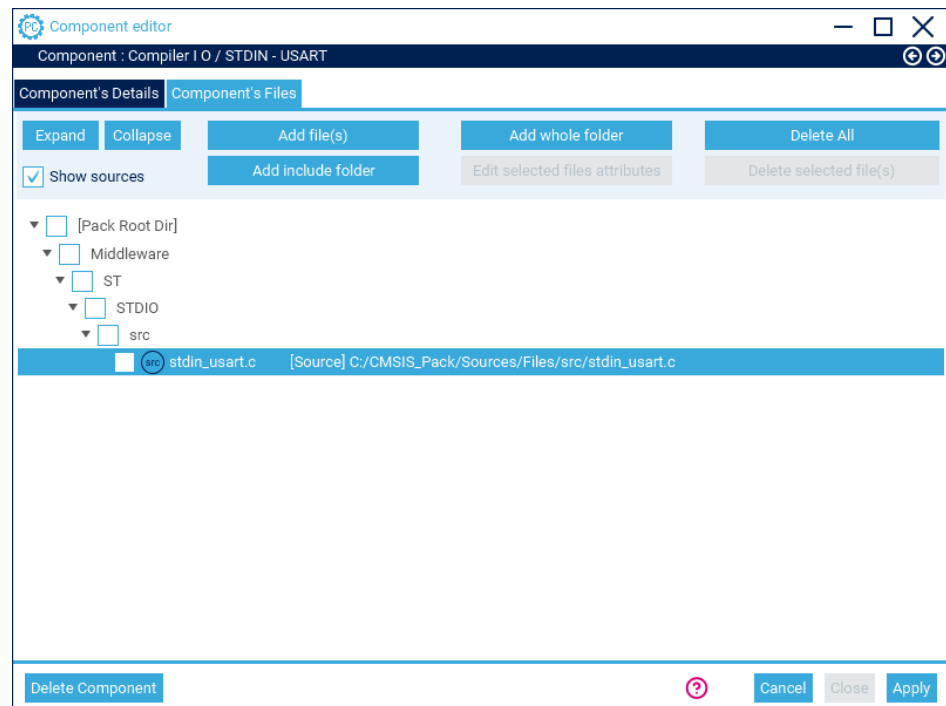
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\stdout_usbd_cdc_fs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

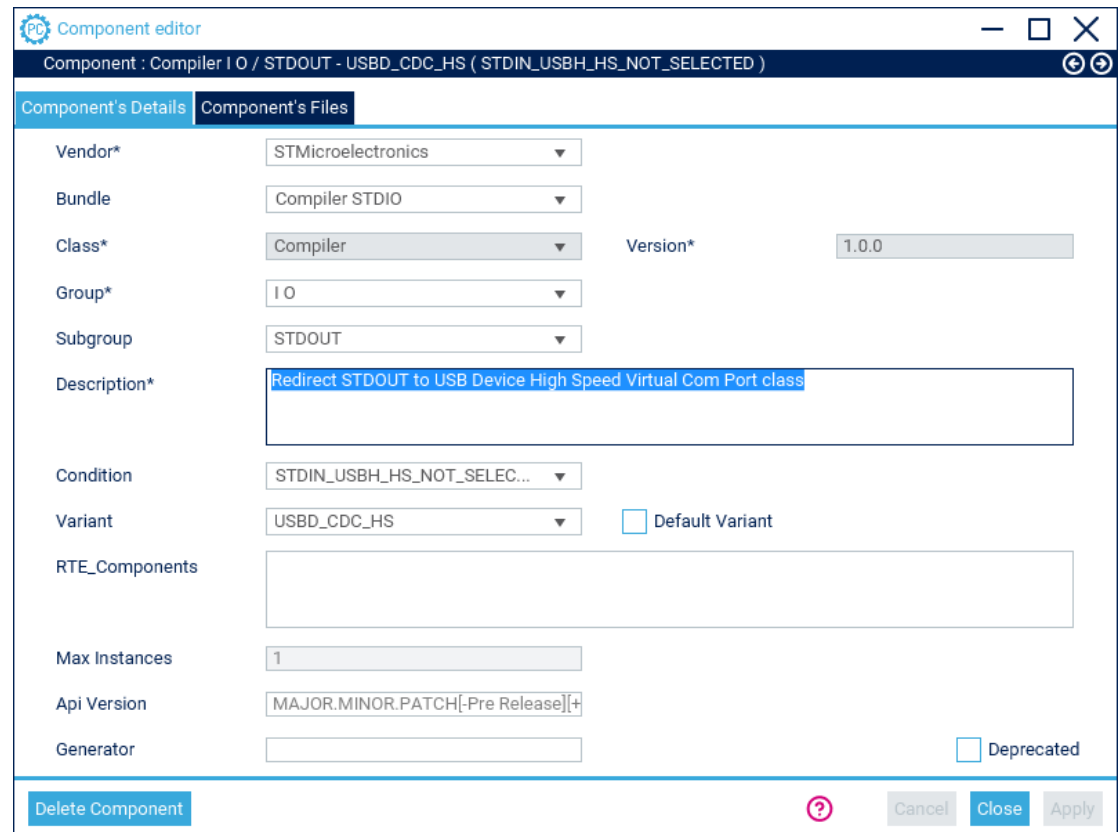
Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Component (STDOUT-USBD_CDC_HS 1/2)

- Create a component
 - Vendor : STMicroelectronics
 - Bundle : Compiler STUDIO
 - Class : Compiler
 - Group : I O
 - Subgroup: STDOUT
 - Variant : USBD_CDC_HS
 - Description :
 - Redirect STDOUT to USB Device High Speed Virtual Com Port class



The screenshot shows the 'Component editor' window with the following details:

- Component:** Compiler I O / STDOUT - USBD_CDC_HS (STDIN_USBH_HS_NOT_SELECTED)
- Component's Details** tab is active.
- Vendor*:** STMicroelectronics
- Bundle:** Compiler STUDIO
- Class*:** Compiler
- Version*:** 1.0.0
- Group*:** I O
- Subgroup:** STDOUT
- Description*:** Redirect STDOUT to USB Device High Speed Virtual Com Port class
- Condition:** STDIN_USBH_HS_NOT_SELEC...
- Variant:** USBD_CDC_HS ☐ Default Variant
- RTE_Components:** (Empty list)
- Max Instances:** 1
- Api Version:** MAJOR.MINOR.PATCH[-Pre Release][+]
- Generator:** (Empty field)
- ☐ Deprecated

Buttons at the bottom: Delete Component, ? (Help), Cancel, Close, Apply.

Add Component (STDIN-USBD_CDC_HS 2/2)

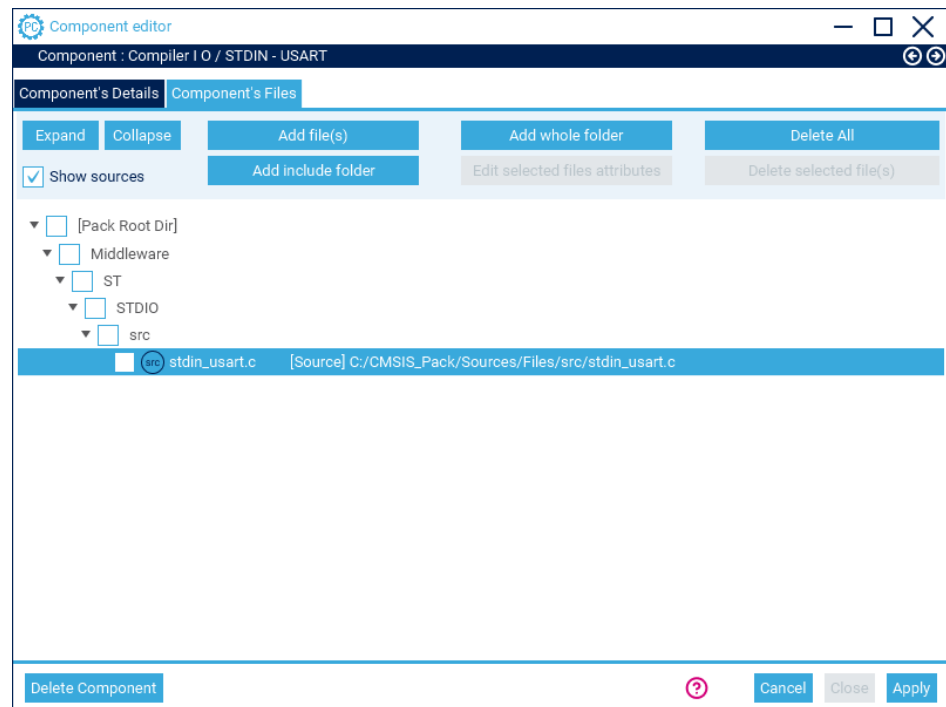
- **Select File:** C:\CMSIS_Pack\Sources\Files\src\stdout_usbd_cdc_hs.c
- **Set Target path:** [Pack Root Dir]/Middleware/ST/STDIO/src

Target path selection

Please select target path in package.

Proposed paths built from STM32CubeMX Rules path + file source path :

- ☐ [Pack Root Dir]/Middleware/ST/STDIO/
- ☒ [Pack Root Dir]/Middleware/ST/STDIO/src



Add Condition (STDOUT_USBD_FS_NOT_SELECTED)

- Class : Compiler
- Cgroup : I O
- Csub : STDOUT
- Cvariant : SUBD_CDC_FS
- Type : deny

The screenshot shows the 'Condition editor' window with the following details:

- Name:** STDOUT_USBD_FS_NOT_SELECTED
- Description:** Prevent STDIN from selecting USBD FS when USBH_HID_FS is selected for STDOUT
- Rule Builder:**
 - Add Line** and **Reset** buttons are present.
 - Four rules are listed:
 - Attribute: Cclass, Value: Compiler
 - Attribute: Cgroup, Value: I O
 - Attribute: Csub, Value: STDOUT
 - Attribute: Cvariant, Value: USBD_CDC_FS
 - Buttons at the bottom: **Add an accept rule**, **Add a deny rule**, and **Add a require rule**.
- Rules:**

Type	Expression
deny	Cclass="Compiler" Cgroup="I O" Csub="STDOUT" Cvariant="USBDCDC_FS"
- Footer:** **Delete Condition** button, **Cancel** and **OK** buttons.

Add Condition (STDOUT_USBD_HS_NOT_SELECTED)

- Class : Compiler
- Cgroup : I O
- Csub : STDOUT
- Cvariant : SUBD_CDC_HS
- Type : deny

The screenshot shows the 'Condition editor' window for the condition 'STDOUT_USBD_HS_NOT_SELECTED'. The window has a title bar with standard window controls. Below the title bar, the 'Name' field contains 'STDOUT_USBD_HS_NOT_SELECTED' and the 'Description' field contains 'Prevent STDIN from selecting USBD HS when USBH_HID_HS is selected for STDOUT'. The 'Rule Builder' section contains a table with four rows, each representing a rule condition. The 'Attribute' column lists 'Cclass', 'Cgroup', 'Csub', and 'Cvariant'. The 'Value' column lists 'Compiler', 'I O', 'STDOUT', and 'USBDCDC_HS'. Below the table, there are buttons for 'Add an accept rule', 'Add a deny rule', and 'Add a require rule'. The 'Type' dropdown is set to 'deny', and the 'Update rule' button is visible. The 'Rules' section at the bottom shows a table with two columns: 'Type' and 'Expression'. The 'Type' is 'deny' and the 'Expression' is 'Cclass="Compiler" Cgroup="I O" Csub="STDOUT" Cvariant="USBDCDC_HS"'. There are also buttons for 'Delete Condition', 'Cancel', and 'OK'.

Attribute	Value
Cclass	Compiler
Cgroup	I O
Csub	STDOUT
Cvariant	USBDCDC_HS

Type	Expression
deny	Cclass="Compiler" Cgroup="I O" Csub="STDOUT" Cvariant="USBDCDC_HS"

Add Condition (STDIN_USBH_FS_NOT_SELECTED)

- Class : Compiler
- Cgroup : I O
- Csub : STDIN
- Cvariant : USBH_HID_FS
- Type : deny

The screenshot shows the 'Condition editor' window with the title 'STDIN_USBH_FS_NOT_SELECTED'. The 'Name' field contains 'STDIN_USBH_FS_NOT_SELECTED' and the 'Description' field contains 'Prevent STDOUT from selecting USBH FS when USBH_CDC_FS is selected for STDIN'. The 'Rule Builder' section has four rules defined:

Line	Attribute	Value
1	Cclass	Compiler
2	Cgroup	I O
3	Csub	STDIN
4	Cvariant	USBH_CDC_FS

Below the rule builder, there are buttons for 'Add an accept rule', 'Add a deny rule', and 'Add a require rule'. The 'Type' dropdown is set to 'deny', and the 'Update rule' button is visible. The 'Rules' section shows a single rule with the expression 'Cclass="Compiler" Cgroup="I O" Csub="STDIN" Cvariant="USBH_CDC_FS"'. At the bottom, there is a 'Delete Condition' button and 'Cancel' and 'OK' buttons.

Add Condition (STDIN_USBH_FS_NOT_SELECTED)

- Class : Compiler
- Cgroup : I O
- Csub : STDIN
- Cvariant : USBH_HID_HS
- Type : deny

The screenshot shows the 'Condition editor' window with the title 'STDIN_USBH_FS_NOT_SELECTED'. The 'Name' field contains 'STDIN_USBH_FS_NOT_SELECTED' and the 'Description' field contains 'Prevent STDOUT from selecting USBH HS when USBH_CDC_HS is selected for STDIN'. The 'Rule Builder' section has four rules defined:

Line	Attribute	Value
1	Cclass	Compiler
2	Cgroup	I O
3	Csub	STDIN
4	Cvariant	USBH_HID_HS

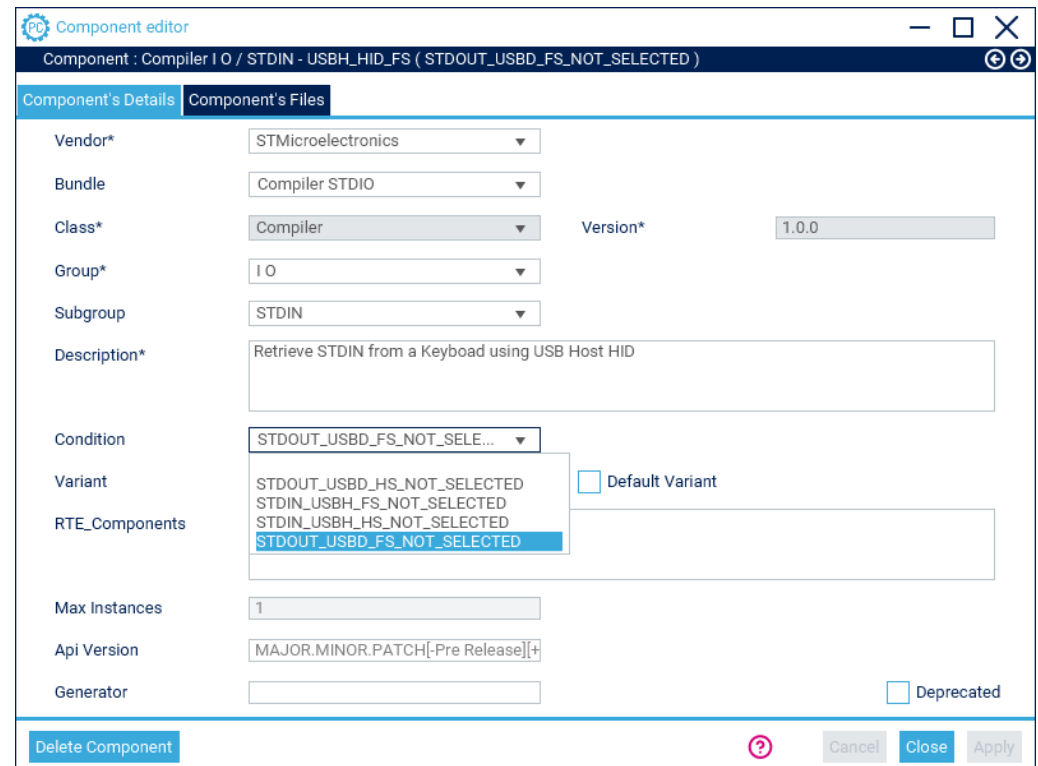
At the bottom of the Rule Builder, there are buttons for 'Add an accept rule', 'Add a deny rule', and 'Add a require rule'. The 'Type' dropdown is set to 'deny', and there is an 'Update rule' button. Below the Rule Builder is a 'Rules' section with a table:

Type	Expression
deny	Cclass="Compiler" Cgroup="I O" Csub="STDIN" Cvariant="USBH_CDC_HS"

At the bottom of the window, there is a 'Delete Condition' button, a help icon, and 'Cancel' and 'OK' buttons.

Add Condition to STDIN_HID_FS

- Add STDOUT_USBD_FS_NOT_SELECTED



The screenshot shows the 'Component editor' window for the 'Compiler I O / STDIN - USBH_HID_FS (STDOUT_USBD_FS_NOT_SELECTED)' component. The 'Component's Details' tab is active. The configuration fields are as follows:

Field	Value
Vendor*	STMicroelectronics
Bundle	Compiler STDIO
Class*	Compiler
Version*	1.0.0
Group*	I O
Subgroup	STDIN
Description*	Retrieve STDIN from a Keyboard using USB Host HID
Condition	STDOUT_USBD_FS_NOT_SELECTED
Variant	STDOUT_USBD_HS_NOT_SELECTED STDIN_USBH_FS_NOT_SELECTED STDIN_USBH_HS_NOT_SELECTED STDOUT_USBD_FS_NOT_SELECTED
RTE_Components	
Max Instances	1
Api Version	MAJOR.MINOR.PATCH[-Pre Release][+]
Generator	

Additional controls include a 'Default Variant' checkbox (unchecked), a 'Deprecated' checkbox (unchecked), and a 'Delete Component' button at the bottom left. The bottom right contains 'Cancel', 'Close', and 'Apply' buttons.

Add Condition to STDIN_HID_HS

- Add STDOUT_USBD_HS_NOT_SELECTED

The screenshot shows the 'Component editor' window for the 'Compiler I O / STDIN - USBH_HID_HS (STDOUT_USBD_HS_NOT_SELECTED)' component. The 'Component's Details' tab is active. The configuration fields are as follows:

Field	Value
Vendor*	STMicroelectronics
Bundle	Compiler STUDIO
Class*	Compiler
Version*	1.0.0
Group*	I O
Subgroup	STDIN
Description*	Retrieve STDIN from a Keyboard using USB Host HS HID
Condition	STDOUT_USBD_HS_NOT_SELECTED
Variant	STDOUT_USBD_HS_NOT_SELECTED (selected), STDIN_USBH_FS_NOT_SELECTED, STDIN_USBH_HS_NOT_SELECTED, STDOUT_USBD_FS_NOT_SELECTED
RTE_Components	
Max Instances	1
Api Version	MAJOR.MINOR.PATCH[-Pre Release][+]
Generator	

Additional options: ☐ Default Variant, ☐ Deprecated.

Buttons at the bottom: Delete Component, ? (help), Cancel, Close, Apply.

Add Condition to STDOUT_CDC_FS

- Add STDIN_USBH_FS_NOT_SELECTED

Component editor

Component : Compiler I O / STDOUT - USB_D_CDC_FS (STDIN_USBH_FS_NOT_SELECTED)

Component's Details | Component's Files

Vendor* : STMicroelectronics

Bundle : Compiler STUDIO

Class* : Compiler

Version* : 1.0.0

Group* : I O

Subgroup : STDOUT

Description* : Redirect STDOUT to USB Device Full Speed Virtual Com Port class

Condition : STDIN_USBH_FS_NOT_SELECTED

Variant :
STDOUT_USBD_HS_NOT_SELECTED
STDIN_USBH_FS_NOT_SELECTED
STDIN_USBH_HS_NOT_SELECTED
STDOUT_USBD_FS_NOT_SELECTED

RTE_Components :

Max Instances : 1

Api Version : MAJOR.MINOR.PATCH[-Pre Release][+]

Generator :

☐ Default Variant

☐ Deprecated

Delete Component ? Cancel Close Apply

Add Condition to STDOUT_CDC_HS

- Add STDIN_USBH_HS_NOT_SELECTED

The screenshot shows the 'Component editor' window with the following configuration:

- Component:** Compiler I O / STDOU - USBDCDC_HS (STDIN_USBH_HS_NOT_SELECTED)
- Component's Details / Component's Files:**
- Vendor*:** STMicroelectronics
- Bundle:** Compiler STUDIO
- Class*:** Compiler
- Version*:** 1.0.0
- Group*:** I O
- Subgroup:** STDOU
- Description*:** Redirect STDOU to USB Device High Speed Virtual Com Port class
- Condition:** STDIN_USBH_HS_NOT_SELEC...
- Variant:** ☐ Default Variant
- RTE_Components:** STDOU_USBD_HS_NOT_SELECTED, STDIN_USBH_HS_NOT_SELECTED (highlighted), STDOU_USBD_FS_NOT_SELECTED
- Max Instances:** 1
- Api Version:** MAJOR.MINOR.PATCH[-Pre Release][+]
- Generator:**
- Buttons:** Delete Component, Cancel, Close, Apply

STM32CubeMX Parameter (STDIN_UART_HANDLER 1/2)

- Add New Parameter
- Name: STDIN_UART_HANDLER
- Type : List
- Possible Values :
 - USART1=huart1
 - USART2=huart2
 - USART3=huart3
 - LPUART1=hlpuart1

The screenshot shows the STM32CubeMX software interface. On the left, a list of parameters is shown under the 'Compiler STDIO' mode, with 'STDIN_UART_HANDLER' selected. The main window displays the configuration for this parameter. The 'Name' is 'STDIN_UART_HANDLER'. The 'Compiler STDIO' is set to 'STDIN_UART_SELECTED'. The 'Type' is 'List'. The 'Default value' is 'huart1'. The 'Possible Values' are listed as 'USART1 = huart1', 'USART2 = huart2', 'USART3 = huart3', and 'LPUART1 = hlpuart1'. The 'Displayed name' is 'STDIN UART HANDLER' and the 'Help message' is 'Select the UART to be used for STDIN'. The 'Tab' is 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. There are 'Delete', 'Cancel', and 'Apply' buttons at the bottom.

Parameter Details	
Name (used by code generation)	STDIN_UART_HANDLER
STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	STDIN_UART_SELECTED
Type	List
Default value	huart1
Possible Values	USART1 = huart1 USART2 = huart2 USART3 = huart3 LPUART1 = hlpuart1
Displayed name	STDIN UART HANDLER
Help message	Select the UART to be used for STDIN
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDIN_UART_HANDLER 2/2)

- Add New Condition
- Name: STDIN_UART_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USART

The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_UART_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO_STDIN_USART' selected. The 'Description' field is 'Retrieve STDIN from USART'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USART', and 'Group' is 'IO'. The 'Condition expression' field contains 'SEMSDIO_Compiler_IOoO_STDIN_USART'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDIN_UART_SELECTED
Components List	SEMSDIO_Compiler_IOoO_STDOUT_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIICDCIIFS SEMSDIO_Compiler_IOoO_STDOUT_USBDIICDCIIFS SEMSDIO_Compiler_IOoO_STDIN_USBHIHIDIIFS SEMSDIO_Compiler_IOoO_STDIN_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIICDCIHS SEMSDIO_Compiler_IOoO_STDIN_USBHIHIDIHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIICDCIHS
Description	Retrieve STDIN from USART
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USART
Group	IO
Condition expression	SEMSDIO_Compiler_IOoO_STDIN_USART

STM32CubeMX Parameter (STDIN_USBD_FS_HANDLER 1/2)

- Add New Parameter
- Name: STDIN_USBD_FS_HANDLER
- Type : String (Read-Only)
- Default value : hUsbDeviceFS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters is displayed under the '[Mode] Compiler STDIO' section. The parameter '[Param] STDIN_USBD_FS_HANDLER' is selected and highlighted in blue. On the right, the 'Parameter Details' panel is visible, showing the configuration for the selected parameter. The 'Name (used by code generation)' field contains 'STDIN_USBD_FS_HANDLER'. The 'STM32CubeMX Mode' is set to 'Condition of Assignment', and the 'Compiler STDIO' is set to 'STDIN_USBD_FS_SELECTED'. The 'Type' is 'String(Read-Only)' and the 'Default value' is 'hUsbDeviceFS'. The 'Displayed name' is 'STDIN USB FS HANDLER' and the 'Help message' is 'USB Device FS Used with STDOUT'. The 'Tab' is 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

Parameter Details	
Name (used by code generation)	STDIN_USBD_FS_HANDLER
STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	STDIN_USBD_FS_SELECTED
Type	String(Read-Only)
Default value	hUsbDeviceFS
Displayed name	STDIN USB FS HANDLER
Help message	USB Device FS Used with STDOUT
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDIN_USBD_FS_HANDLER 2/2)

- Add New Condition
- Name: STDIN_USBD_FS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiFS

The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_USBD_FS_SELECTED'. The 'Components List' contains several items, with 'SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiFS' selected. The 'Description' field is 'Retrieve STDIN from USB Device FS Virtual Com Port'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USBD_CDC_FS', and 'Group' is 'IO'. The 'Condition expression' field contains 'SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiFS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDIN_USBD_FS_SELECTED
Components List	SEMSTDIO_Compiler_IOoO_STDOUT_USART SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiFS SEMSTDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiFS SEMSTDIO_Compiler_IOoO_STDIN_USBHIIHIIIFS SEMSTDIO_Compiler_IOoO_STDIN_USART SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSTDIO_Compiler_IOoO_STDIN_USBHIIHIIHS SEMSTDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS
Description	Retrieve STDIN from USB Device FS Virtual Com Port
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USBD_CDC_FS
Group	IO
Condition expression	SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiFS

STM32CubeMX Parameter (STDIN_USBD_HS_HANDLER 1/2)

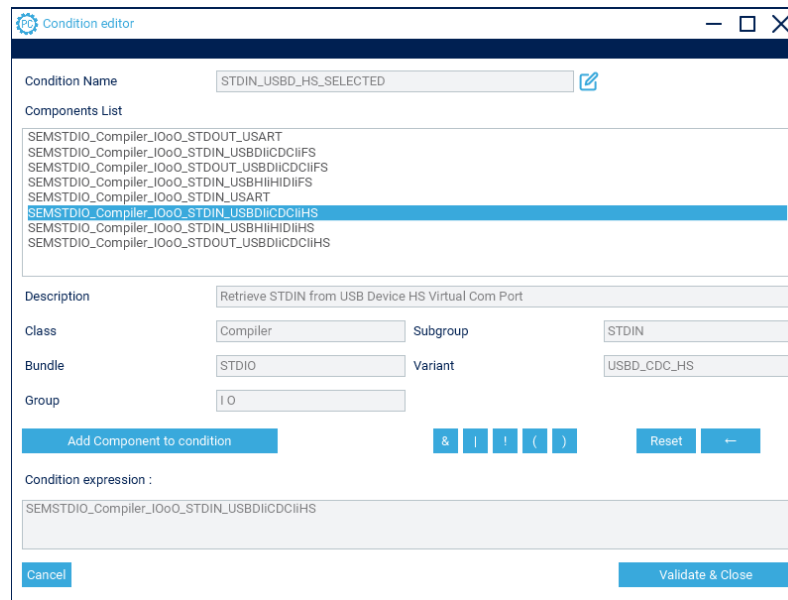
- Add New Parameter
- Name: STDIN_USBD_HS_HANDLER
- Type : String (Read-Only)
- Default value : hUsbDeviceHS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters is displayed under the '[Mode] Compiler STDIO' group. The parameter '[Param] STDIN_USBD_HS_HANDLER' is selected and highlighted. On the right, the 'Parameter Details' panel shows the configuration for this parameter. The 'Name (used by code generation)' is 'STDIN_USBD_HS_HANDLER'. The 'STM32CubeMX Mode' is 'Condition of Assignment' and the 'Compiler STDIO' is 'Condition_1'. The 'Type' is 'String(Read-Only)' and the 'Default value' is 'hUsbDeviceHS'. The 'Displayed name' is 'STDIN USB HS HANDLER' and the 'Help message' is 'USB Device HS Used with STDOUT'. The 'Tab' is 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

Parameter Details	
Name (used by code generation)	STDIN_USBD_HS_HANDLER
STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	Condition_1
Type	String(Read-Only)
Default value	hUsbDeviceHS
Displayed name	STDIN USB HS HANDLER
Help message	USB Device HS Used with STDOUT
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDIN_USBD_HS_HANDLER 2/2)

- Add New Condition
- Name: STDIN_USBD_HS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS



The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_USBD_HS_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS' selected. The 'Description' field is 'Retrieve STDIN from USB Device HS Virtual Com Port'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USBD_CDC_HS', and 'Group' is 'IO'. The 'Condition expression' field shows 'SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDIN_USBD_HS_SELECTED
Components List	SEMSDIO_Compiler_IOoO_STDOUT_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS
Description	Retrieve STDIN from USB Device HS Virtual Com Port
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USBD_CDC_HS
Group	IO
Condition expression	SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS

STM32CubeMX Parameter (STDIN_USBH_FS_HANDLER 1/2)

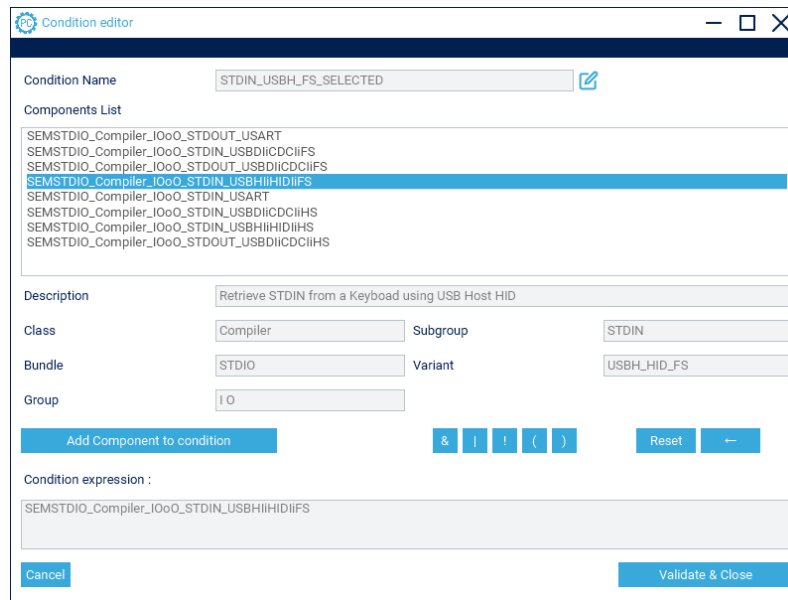
- Add New Parameter
- Name: STDIN_USBH_FS_HANDLER
- Type : String (Read-Only)
- Default value : hUsbHostFS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters is displayed under the '[Mode] Compiler STDIO' section. The parameter '[Param] STDIN_USBH_FS_HANDLER' is selected and highlighted in blue. On the right, the 'Parameter Details' panel is visible, showing the configuration for the selected parameter. The 'Name (used by code generation)' field contains 'STDIN_USBH_FS_HANDLER'. The 'STM32CubeMX Mode' is set to 'Condition of Assignment', and the 'Compiler STDIO' is set to 'STDIN_USBH_FS_SELECTED'. The 'Type' is set to 'String(Read-Only)' and the 'Default value' is 'hUsbHostFS'. The 'Displayed name' is 'STDIN USBH FS HANDLER' and the 'Help message' is 'USBH FS Used for STDIN'. The 'Tab' is set to 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

Parameter Details	
Name (used by code generation)	STDIN_USBH_FS_HANDLER
STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	STDIN_USBH_FS_SELECTED
Type	String(Read-Only)
Default value	hUsbHostFS
Displayed name	STDIN USBH FS HANDLER
Help message	USBH FS Used for STDIN
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDIN_USBH_FS_HANDLER 2/2)

- Add New Condition
- Name: STDIN_USBH_FS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USBHIiHIDIiFS



The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_USBH_FS_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiFS' highlighted. The 'Description' field is 'Retrieve STDIN from a Keyboard using USB Host HID'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USBH_HID_FS', and 'Group' is 'IO'. The 'Condition expression' field contains 'SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiFS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDIN_USBH_FS_SELECTED
Components List	SEMSDIO_Compiler_IOoO_STDOUT_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIICDCIIFS SEMSDIO_Compiler_IOoO_STDOUT_USBDIICDCIIFS SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiFS SEMSDIO_Compiler_IOoO_STDIN_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIICDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIICDCIiHS
Description	Retrieve STDIN from a Keyboard using USB Host HID
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USBH_HID_FS
Group	IO
Condition expression	SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiFS

STM32CubeMX Parameter (STDIN_USBH_HS_HANDLER 1/2)

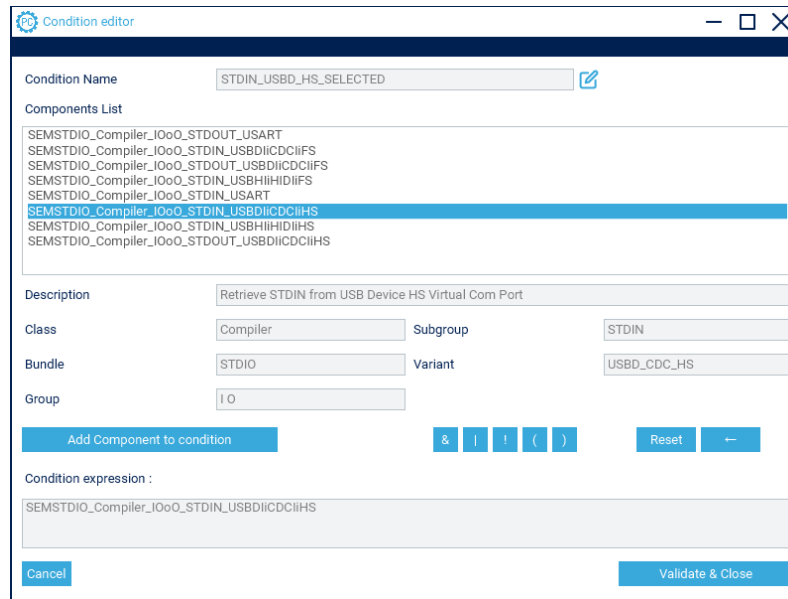
- Add New Parameter
- Name: STDIN_USBH_HS_HANDLER
- Type : String (Read-Only)
- Default value : hUsbHostFS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters under the '[Mode] Compiler STDIO' group is displayed. The parameter '[Param] STDIN_USBH_HS_HANDLER' is selected and highlighted in blue. On the right, the 'Parameter Details' panel is visible, showing the configuration for the selected parameter. The 'Name (used by code generation)' field contains 'STDIN_USBH_FS_HANDLER'. The 'STM32CubeMX Mode' is set to 'Condition of Assignment', and the 'Compiler STDIO' is set to 'STDIN_USBH_FS_SELECTED'. The 'Type' is set to 'String(Read-Only)' and the 'Default value' is 'hUsbHostFS'. The 'Displayed name' is 'STDIN USBH FS HANDLER' and the 'Help message' is 'USBH FS Used for STDIN'. The 'Tab' is set to 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

Parameter Details	
Name (used by code generation)	STDIN_USBH_FS_HANDLER
STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	STDIN_USBH_FS_SELECTED
Type	String(Read-Only)
Default value	hUsbHostFS
Displayed name	STDIN USBH FS HANDLER
Help message	USBH FS Used for STDIN
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDIN_USBH_HS_HANDLER 2/2)

- Add New Condition
- Name: STDIN_USBH_HS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS



The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_USBH_HS_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS' selected. The 'Description' field is 'Retrieve STDIN from USB Device HS Virtual Com Port'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USBH_CDC_HS', and 'Group' is 'IO'. The 'Condition expression' field shows 'SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDIN_USBH_HS_SELECTED
Components List	SEMSDIO_Compiler_IOoO_STDOUT_USART SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDIN_USART SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBHIiHIDIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBHIiHIDIiHS
Description	Retrieve STDIN from USB Device HS Virtual Com Port
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USBH_CDC_HS
Group	IO
Condition expression	SEMSDIO_Compiler_IOoO_STDIN_USBHIiHIDIiHS

STM32CubeMX Parameter (STDOUT_UART_HANDLER1/2)

- Add New Parameter
- Name: STDOUT_UART_HANDLER
- Type : List
- Possible Values :
 - USART1=huart1
 - USART2=huart2
 - USART3=huart3
 - LPUART1=hlpuart1

The screenshot shows the STM32CubeMX software interface. On the left, a tree view under '[Mode] Compiler STDIO' lists several parameters, with '[Param] STDOUT_UART_HANDLER' selected and highlighted in blue. The main window is titled 'Parameter Details' and contains the following fields:

- Name (used by code generation)**: STDOUT_UART_HANDLER
- STM32CubeMX Mode**: Condition of Assignment
- Compiler STDIO**: STDOUT_UART_SELECTED (dropdown)
- Type**: List (dropdown)
- Default value**: huart1
- Possible Values**: A list with four items: USART1 = huart1, USART2 = huart2, USART3 = huart3, and LPUART1 = hlpuart1. Each item has a small icon to its left (a plus, a checkmark, a checkmark, and a plus respectively).
- Displayed name**: STDOUT UART HANDLER
- Help message**: Select the UART to be used for STDOUT
- Tab**: Parameter Settings (dropdown)
- Group in Tab**: Basic Parameters (dropdown)

At the bottom of the window, there are three buttons: 'Delete', 'Cancel', and 'Apply'.

STM32CubeMX Parameter (STDOUT_UART_HANDLER 2/2)

- Add New Condition
- Name: STDOUT_UART_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO STDOUT_USART

The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDOUT_UART_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO STDOUT_USART' selected. The 'Description' field is 'Retrieve STDIN from USART'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USART', and 'Group' is 'IO'. The 'Condition expression' field shows 'SEMSDIO_Compiler_IOoO STDOUT_USART'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Field	Value
Condition Name	STDOUT_UART_SELECTED
Components List	SEMSDIO_Compiler_IOoO STDOUT_USART (selected)
Description	Retrieve STDIN from USART
Class	Compiler
Subgroup	STDIN
Bundle	STDIO
Variant	USART
Group	IO
Condition expression	SEMSDIO_Compiler_IOoO STDOUT_USART

STM32CubeMX Parameter (STDOUT_USBD_FS_HANDLER1/2)

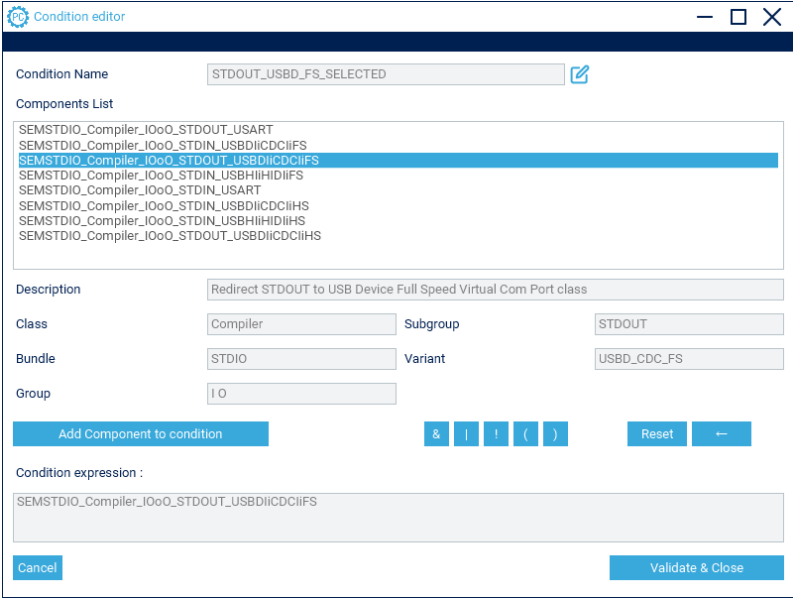
- Add New Parameter
- Name:STDOUT_USBD_FS_HANDLER
- Type :String (Read-Only)
- Default value: hUsbDeviceFS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters is displayed under the '[Mode] Compiler STDIO' section. The parameter '[Param] STDOUT_USBD_FS_HANDLER' is selected and highlighted in blue. On the right, the 'Parameter Details' panel is open, showing the configuration for the selected parameter. The 'Name (used by code generation)' field contains 'STDOUT_USBD_FS_HANDLER'. The 'STM32CubeMX Mode' is set to 'Compiler STDIO', and the 'Condition of Assignment' is 'STDOUT_USBD_FS_SELECTED'. The 'Type' is 'String(Read-Only)' and the 'Default value' is 'hUsbDeviceFS'. The 'Displayed name' is 'STDOUT USB FS HANDLER' and the 'Help message' is 'USB FS Used for STDOUT'. The 'Tab' is 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

Parameter Details	
Name (used by code generation)	STDOUT_USBD_FS_HANDLER
STM32CubeMX Mode	Compiler STDIO
Condition of Assignment	STDOUT_USBD_FS_SELECTED
Type	String(Read-Only)
Default value	hUsbDeviceFS
Displayed name	STDOUT USB FS HANDLER
Help message	USB FS Used for STDOUT
Tab	Parameter Settings
Group in Tab	Basic Parameters

STM32CubeMX Parameter (STDOUT_USBD_FS_HANDLER 2/2)

- Add New Condition
- Name: STDOUT_USBD_FS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS



The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDOUT_USBD_FS_SELECTED'. The 'Components List' contains several entries, with 'SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS' selected. The 'Description' field is 'Redirect STDOUT to USB Device Full Speed Virtual Com Port class'. The 'Class' is 'Compiler', 'Subgroup' is 'STDOUT', 'Bundle' is 'STDIO', 'Variant' is 'USBD_CDC_FS', and 'Group' is 'IO'. The 'Condition expression' field shows 'SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Condition Name	Condition Name
STDOUT_USBD_FS_SELECTED	STDOUT_USBD_FS_SELECTED

Components List	
SEMSDIO_Compiler_IOoO STDOUT_USART	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	

Description	
Redirect STDOUT to USB Device Full Speed Virtual Com Port class	

Class	
Compiler	Subgroup

Bundle	
STDIO	Variant

Group	
IO	

Condition expression :	
SEMSDIO_Compiler_IOoO STDOUT_USBDIiCDCIiFS	

STM32CubeMX Parameter (STDOUT_USBD_HS_HANDLER1/2)

- Add New Parameter
- Name:STDOUT_USBD_HS_HANDLER
- Type :String (Read-Only)
- Default value: hUsbDeviceHS

The screenshot shows the STM32PackCreator application window. On the left, a list of parameters is displayed under the '[Mode] Compiler STDIO' section. The parameter '[Param] STDOUT_USBD_HS_HANDLER' is selected and highlighted in blue. On the right, the 'Parameter Details' panel is open, showing the configuration for the selected parameter. The 'Name (used by code generation)' field contains 'STDOUT_USBD_HS_HANDLER'. Below this, a table shows the 'STM32CubeMX Mode' and 'Condition of Assignment' for 'Compiler STDIO', with the condition set to 'Always'. The 'Type' is set to 'String(Read-Only)' and the 'Default value' is 'hUsbDeviceHS'. The 'Displayed name' is 'STDOUT USB HS HANDLER' and the 'Help message' is 'USB HS used for STDOUT'. The 'Tab' is set to 'Parameter Settings' and the 'Group in Tab' is 'Basic Parameters'. At the bottom right, there are 'Delete', 'Cancel', and 'Apply' buttons.

STM32CubeMX Mode	Condition of Assignment
Compiler STDIO	Always

Type: String(Read-Only)
Default value: hUsbDeviceHS
Displayed name: STDOUT USB HS HANDLER
Help message: USB HS used for STDOUT
Tab: Parameter Settings
Group in Tab: Basic Parameters

STM32CubeMX Parameter (STDIN_USBD_HS_HANDLER 2/2)

- Add New Condition
- Name: STDIN_USBD_HS_SELECTED
- Condition : SEMSTDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS

The screenshot shows the 'Condition editor' window in STM32CubeMX. The 'Condition Name' field is set to 'STDIN_USBD_HS_SELECTED'. The 'Components List' contains several items, with 'SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS' selected. The 'Description' field is 'Retrieve STDIN from USB Device HS Virtual Com Port'. The 'Class' is 'Compiler', 'Subgroup' is 'STDIN', 'Bundle' is 'STDIO', 'Variant' is 'USBD_CDC_HS', and 'Group' is 'IO'. The 'Condition expression' field contains 'SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS'. The window has 'Cancel' and 'Validate & Close' buttons at the bottom.

Condition Name	Components List	Description	Class	Subgroup	Bundle	Variant	Group	Condition expression
STDIN_USBD_HS_SELECTED	SEMSDIO_Compiler_IOoO_STDOUT_USART SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS SEMSDIO_Compiler_IOoO_STDOUT_USBDIiCDCIiHS	Retrieve STDIN from USB Device HS Virtual Com Port	Compiler	STDIN	STDIO	USBD_CDC_HS	IO	SEMSDIO_Compiler_IOoO_STDIN_USBDIiCDCIiHS

Save & Generate Pack

- Save & Generate the Pack

