



TransSECS GEM Host Tool Characterization Guide

Using a TransSECS GEM Host Project
to get VIDs, CEIDs, and RPTIDs from a
Process Tool Running SECS/GEM



TransSECS Tool Characterization Guide Overview

This documentation will guide you through using the characterization features of TransSECS for a GEM Host.

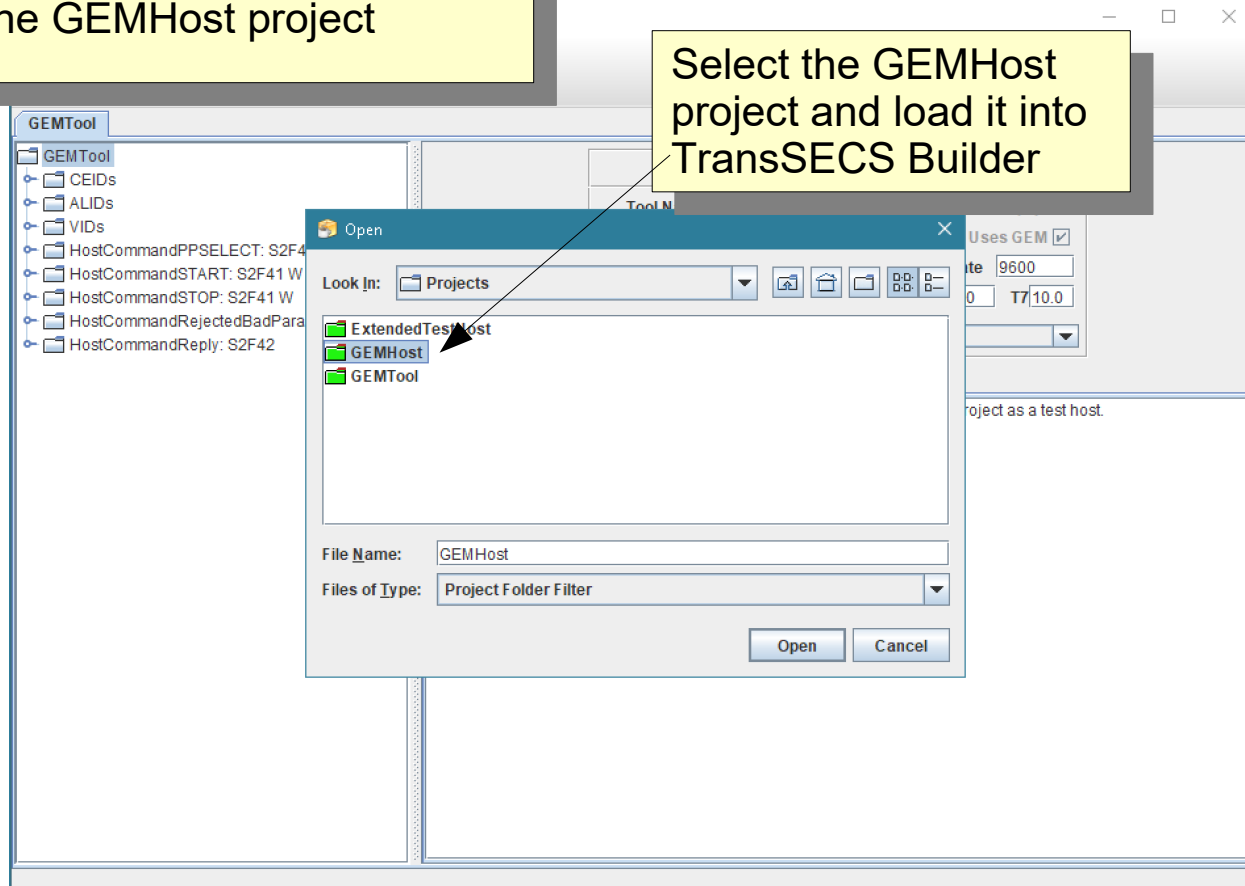
This guide should be used as a supplement to any TransSECS GEM Host Guides, such as for any TransSECS Server Guides for GEM Host applications (MQTT, OPCUA, Azure, etc.) or TransSECS for MISTudio, TransSECS for Devices (PLCs), or Programmatic TransSECS.



Load the GEMHost Project

For this example we will start with the GEMHost project

Select the GEMHost project and load it into TransSECS Builder





33.5
35.7
32.2
30.9
28.6

Preparing the GEMHost

The GEMHost already has some test VIDs, CEIDs, and RPTIDs. These need to be removed before connecting to your tool.

Follow the next steps to prepare the GEMHost for characterizing your process tool.



Prepare the GEMHost for Characterization

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost Simulation

CEIDs
RPTIDs
VIDs

SVIDRequest: S1F3 W
SVIDResponse: S1F4
SVID List: S1F11 W
SVIDListReply: S1F12
Request OffLine: S1F15 W
OfflineAck: S1F16
Request OnLine: S1F17 W
OnLineAck: S1F18
CEIDList: 'S1F23' W
ECIDRequest: S2F13 W
ECIDValueResponse: S2F14
ECIDValueChange: S2F15 W
ECIDChangeACK: S2F16
HostCommandPPSELECT: S2F41 W
HostCommandSTART: S2F41 W
HostCommandSTOP: S2F41 W
HostCommandReply: S2F42
Enable All Alarms: S5F3 W
EventReportRequest: S6F15
RequestedEventMessage: S6F16
RequestIndividualReport: S6F19 W
IndividualReportData: S6F20

We will remove these pre-configured CEIDs, RPTIDs, and VIDs to demonstrate how to get these from your process tool

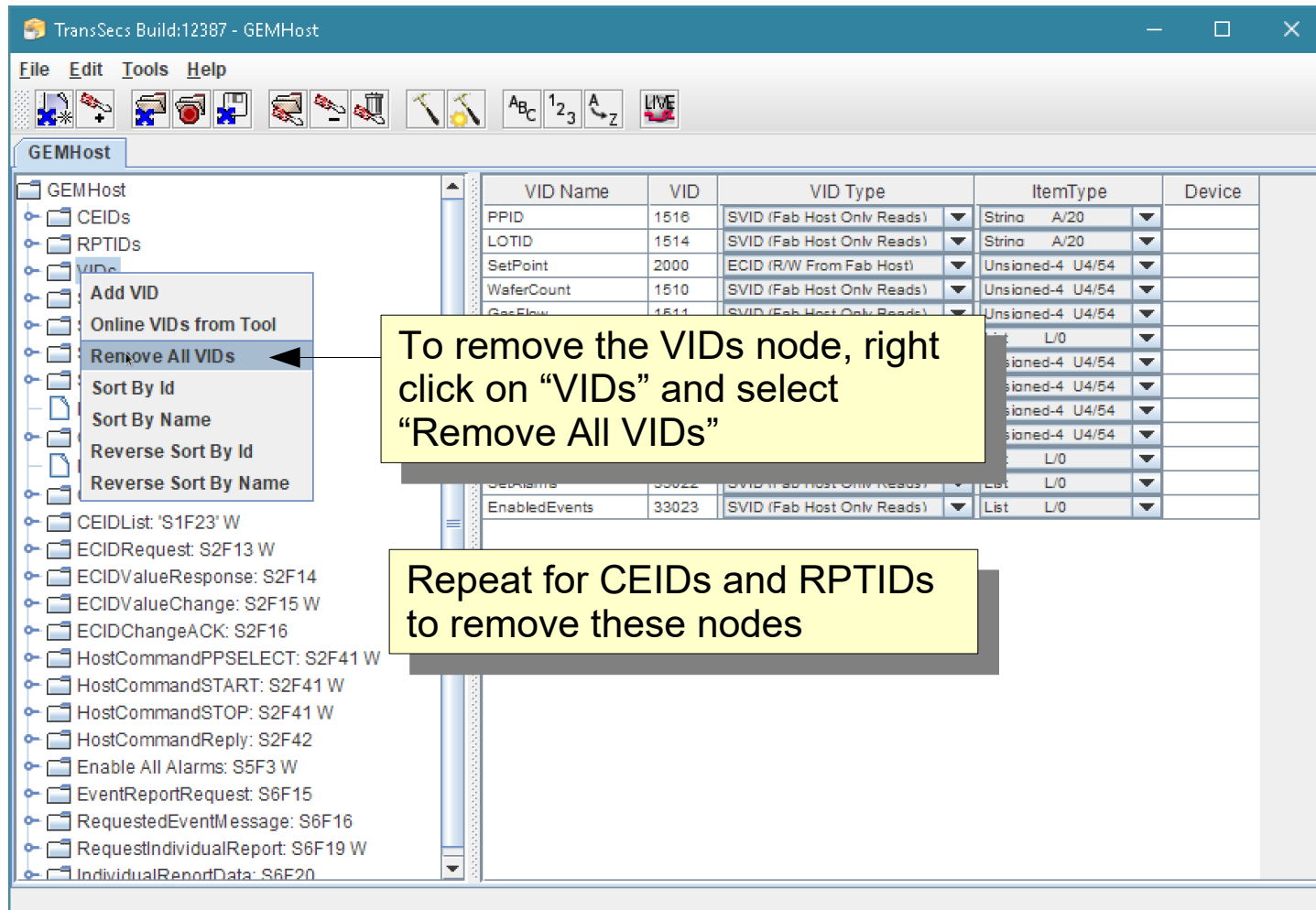
Tool Attributes

Equip.
\$ GEM
19200
T7/10.0

Description

Sample Host for TransSECS. Use with the GEMTool project.

Prepare the GEMHost for Characterization



To remove the VIDs node, right click on "VIDs" and select "Remove All VIDs"

VID Name	VID	VID Type	ItemType	Device
PPID	1516	SVID (Fab Host Only Reads)	String A/20	
LOTID	1514	SVID (Fab Host Only Reads)	String A/20	
SetPoint	2000	ECID (R/W From Fab Host)	Unsigned-4 U4/54	
WaferCount	1510	SVID (Fab Host Only Reads)	Unsigned-4 U4/54	
GasFlow	1511	SVID (Fab Host Only Reads)	Unsigned-4 U4/54	
			L/0	
			signed-4 U4/54	
			signed-4 U4/54	
			signed-4 U4/54	
			signed-4 U4/54	
			L/0	
			L/0	
SEASalts	33022	SVID (Fab Host Only Reads)	List L/0	
EnabledEvents	33023	SVID (Fab Host Only Reads)	List L/0	

Repeat for CEIDs and RPTIDs to remove these nodes



33.5
35.7
32.2
30.9
28.2

Prepare the GEMHost for Characterization

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

Tool Attributes

Equip.

Uses GEM

aud Rate 19200

T6 5.0 T7 10.0

Deployment Type OPCUA Server

Description

Right-Click on the project tool name "GEMHost" and select "Add VID's"

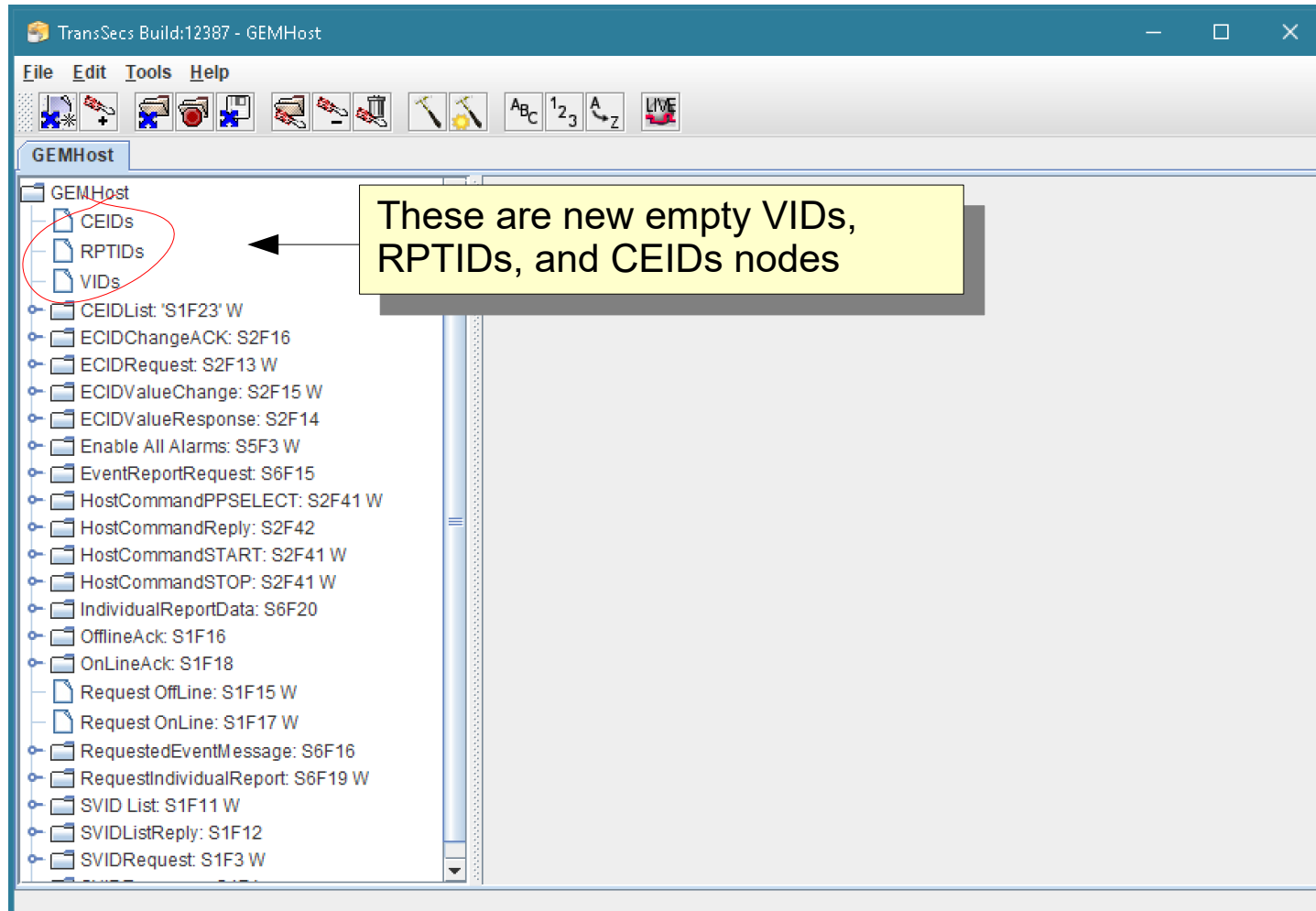
Repeat this procedure to add an empty CEIDs node and an empty RPTIDs node

Now we need to add empty a new VID node, which will be empty (no VID's yet)

- Add Message F3 W
- Add VID's S1F3 W
- Add CEIDs W
- Add RPTIDs 1F12
- Request OnLine: S1F15 W
- OfflineAck: S1F16
- Request OnLine: S1F17 W
- OnLineAck: S1F18
- CEIDList: 'S1F23' W
- ECIDRequest: S2F13 W
- ECIDValueResponse: S2F14
- ECIDValueChange: S2F15 W
- ECIDChangeACK: S2F16
- HostCommandPPSELECT: S2F41 W
- HostCommandSTART: S2F41 W
- HostCommandSTOP: S2F41 W
- HostCommandReply: S2F42
- Enable All Alarms: S5F3 W
- EventReportRequest: S6F15
- RequestedEventMessage: S6F16
- RequestIndividualReport: S6F19 W
- IndividualReportData: S6F20



Prepare the GEMHost for Characterization





Prepare the GEMHost for Characterization

The screenshot shows the 'TransSecs Build:12387 - GEMHost' application window. The interface includes a menu bar (File, Edit, Tools, Help), a toolbar, and a tree view on the left. The tree view shows a hierarchy of nodes under 'GEMHost', with the 'Project Node' selected. A 'Tool Attributes' dialog box is open, displaying configuration fields for a tool named 'GEMHost'. The fields include 'Tool IP Addr...' (localhost), 'Device ID' (1), 'Port' (5010), 'Baud Rate' (19200), and 'Deployment Type' (OPCUA Server). There are also fields for 'T1' through 'T7' with values ranging from 0.5 to 45.0. The 'Host' radio button is selected, and 'Uses GEM' is checked. A note at the bottom of the dialog says 'Use with the GEMTool project'.

Click on the Project Node to configure the Tool Parameters

Tool IP Address

Tool Device ID

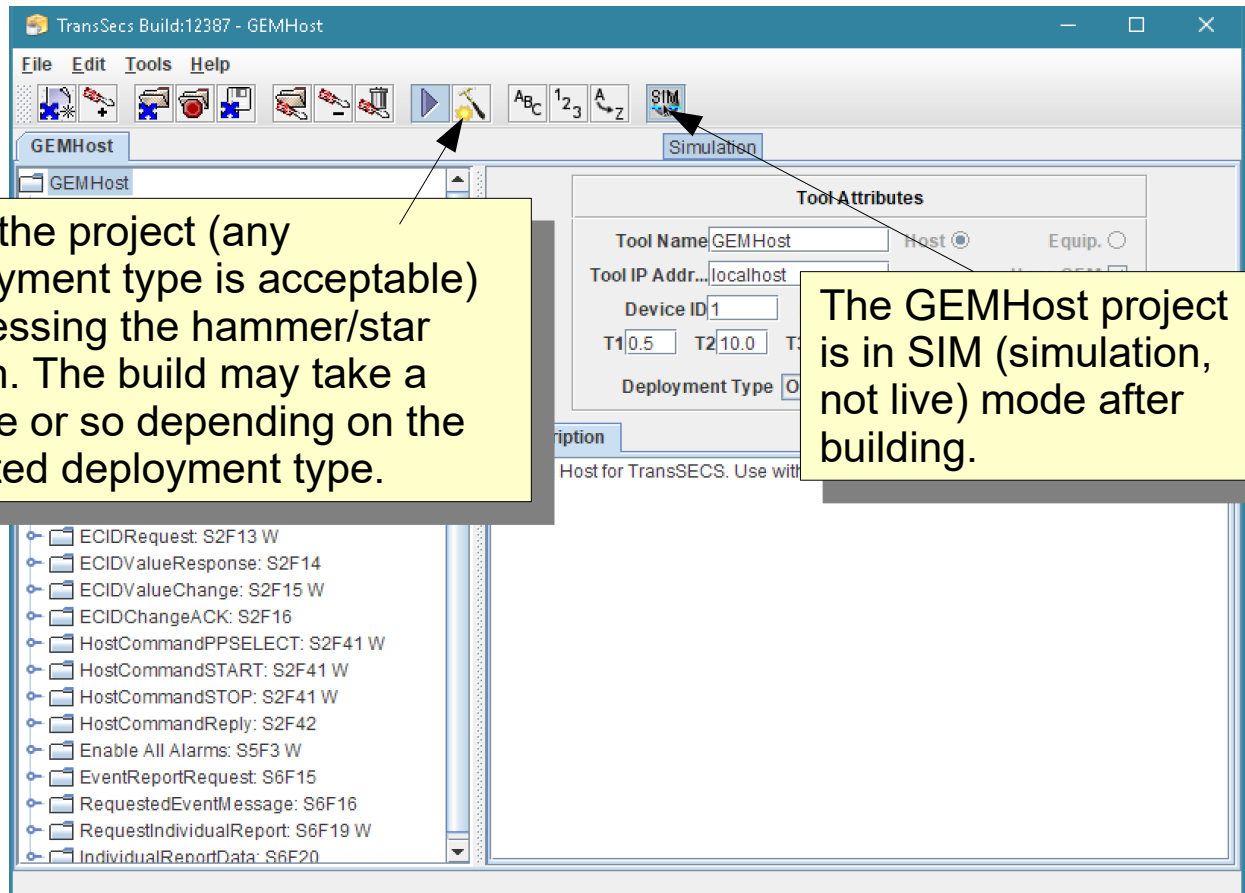
Tool SECS Port

Configure the connection parameters for your process tool. These include the hostname (tool IP address), SECS port, and device id.



33.5
35.7
32.2
30.9
28.8

Build the GEMHost Project



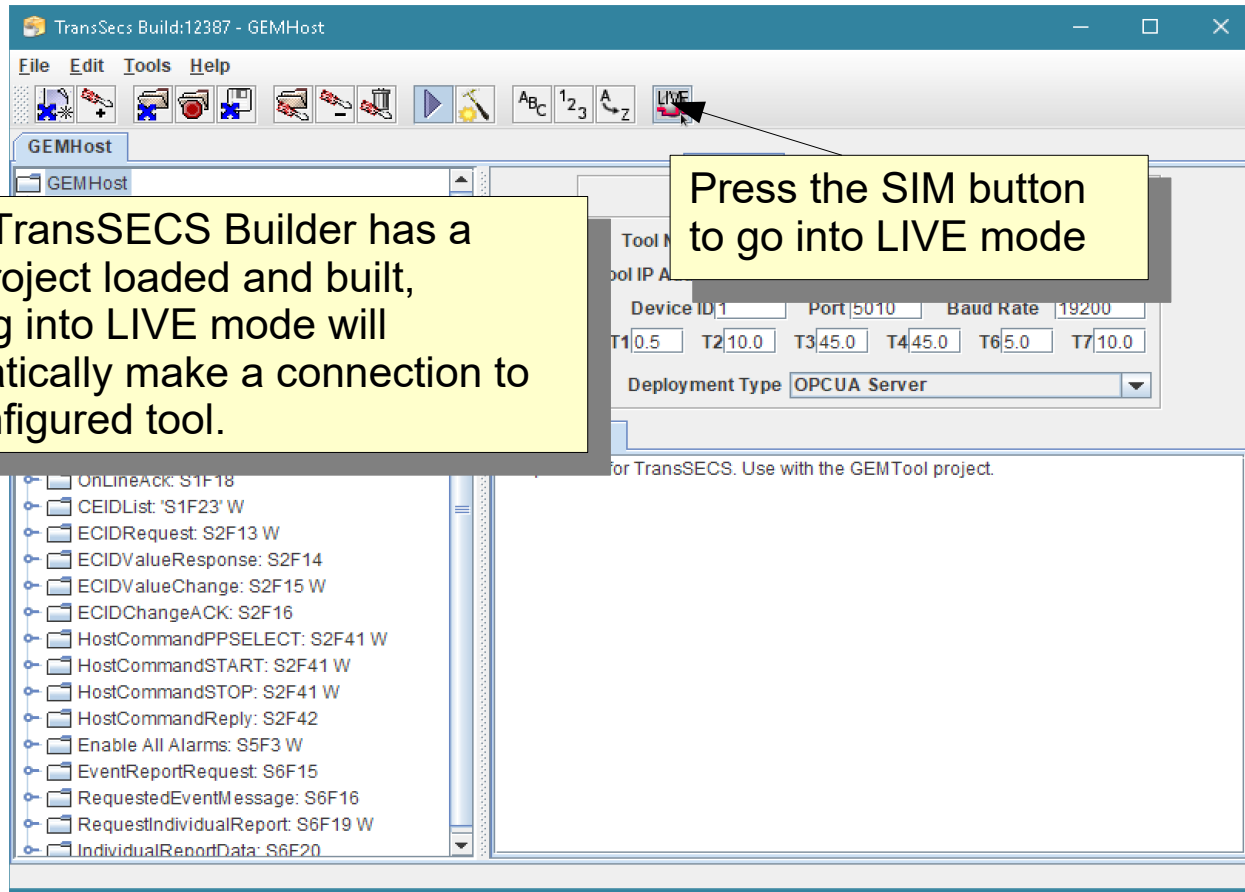
Build the project (any deployment type is acceptable) by pressing the hammer/star button. The build may take a minute or so depending on the selected deployment type.

The GEMHost project is in SIM (simulation, not live) mode after building.



33.5
35.7
32.2
30.9
28.8

Toggle GEMHost to LIVE



Press the SIM button to go into LIVE mode

When TransSECS Builder has a Host project loaded and built, toggling into LIVE mode will automatically make a connection to the configured tool.



Toggle GEMHost to LIVE

Select any message to see the messages in the Message Panel to the right

Check that the GEMHost has connected to the tool after toggling to LIVE – Check that the tool responded to the S1F13 and the S1F17 to request ONLINE/REMOTE

Message Response:

```

SENT: 2019.05.06 10:17:47.306
S1F13 W <L[0]
> .

RECEIVED: 2019.05.06 10:17:47.325
S1F14 <L[2]
<B 0x0> /* Decimal[1]: 0 */
<L[2]
<A 'GEMToo'>
<A 'Rev2.0'>
> .

SENT: 2019.05.06 10:17:47.339
S1F17 W .

RECEIVED: 2019.05.06 10:17:47.345
S1F18 <B 0x0> /* Decimal[1]: 0 */.

```

Send Message Log Bytes Log Events Lock Scroll

S1F13 and S1F14 reply

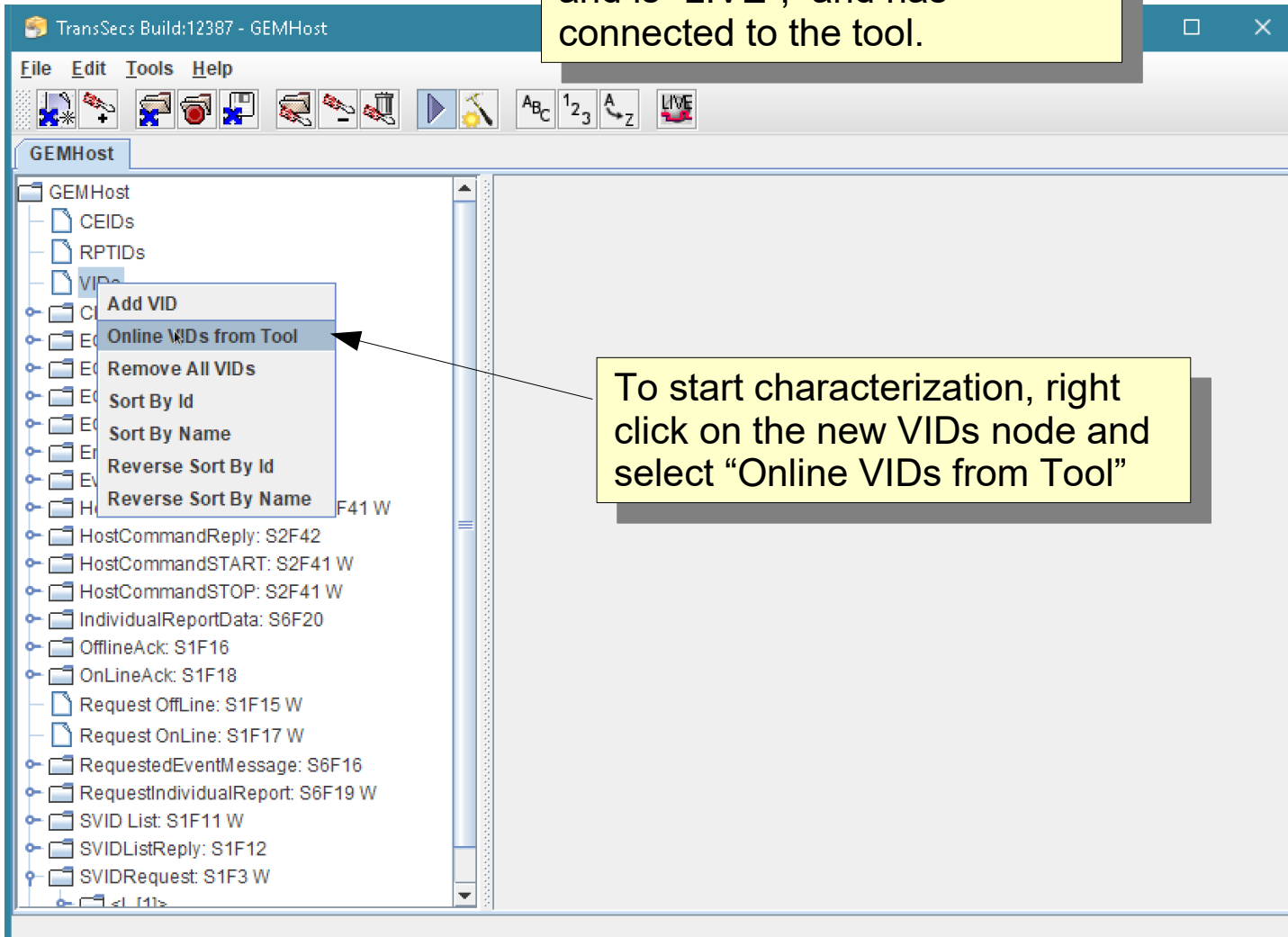
S1F17 and S1F18 reply



33.5
35.7
32.2
30.9
28.8

Characterization - VIDs

TransSECS is in "Run" mode and is "LIVE", and has connected to the tool.



To start characterization, right click on the new VIDs node and select "Online VIDs from Tool"



33.5
35.7
32.2
30.9
28.2

Characterization - VIDs

The screenshot shows the 'TransSecs Build:12387 - GEMHost' application window. On the left, a tree view under 'VIDs' lists various nodes: EventsEnabled, AlarmsSet, AlarmsEnabled, SpoolFullTime, SpoolStartTime, SpoolCountTotal, SpoolCountActual, CLOCK, OnlineOfflineState, LocalRemoteState, LastControlState, ControlState, CommunicationsState, SOFTREV, MDLN, WaferCount, ProcessTemperature, GasFlow, LOTID, and PPID. Below this are other nodes like 'CEIDList: 'S1F23' W', 'ECIDChangeACK: S2F16', and 'ECIDRequest: S2F12 W'. On the right, a detailed view for the selected 'EventsEnabled' VID shows its Name, VID (33023), and VID Type (SVID). A yellow callout box points to the 'EventsEnabled' node in the tree and contains the text: 'The VIDs node will be populated with all the available VIDs from the tool. Remove VIDs which are not relevant to your project.' A lightbulb icon is positioned above a blue callout box that contains the text: 'It is a good idea to treat the tool's equivalent to OnlineOfflineState and LocalRemoteState as read only in your application so that the tool is the only entity setting these values for safety reasons.'



Characterization - CEIDs

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

- GEMHost
 - CEID
 - RE
 - VI
 - CE
 - EC
 - EC
 - EC
 - EC
 - EC
 - EC
 - Enable All Alarms: S0F3 W
 - EventReportRequest: S6F15
 - HostCommandPPSELECT: S2F41 W
 - HostCommandReply: S2F42
 - HostCommandSTART: S2F41 W
 - HostCommandSTOP: S2F41 W
 - IndividualReportData: S6F20
 - OfflineAck: S1F16
 - OnLineAck: S1F18
 - Request OffLine: S1F15 W
 - Request OnLine: S1F17 W
 - RequestedEventMessage: S6F16
 - RequestIndividualReport: S6F19 W
 - SVID List: S1F11 W
 - SVIDListReply: S1F12
 - SVIDRequest: S1F3 W
 - SVIDResponse: S1F4

Get the CEIDs from the tool using the Right-Click "Online CEIDs from Tool" option



33.5
35.7
32.2
30.9
28.2

Characterization - RPTIDs

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

- GEMHost
 - CEIDs
 - VID
 - Add RPTID
 - Online RPTIDs from Tool
 - Remove All RPTIDs
 - Sort By Name
 - Sort By Id
 - Sort By Name
 - Sort By Id
 - HostCommandPPSELECT: S2F41 W
 - HostCommandReply: S2F42
 - HostCommandSTART: S2F41 W
 - HostCommandSTOP: S2F41 W
 - IndividualReportData: S6F20
 - OfflineAck: S1F16
 - OnLineAck: S1F18
 - Request OffLine: S1F15 W
 - Request OnLine: S1F17 W
 - RequestedEventMessage: S6F16
 - RequestIndividualReport: S6F19 W
 - SVID List: S1F11 W
 - SVIDListReply: S1F12
 - SVIDRequest: S1F3 W
 - SVIDResponse: S1F4

Finally, get the RPTIDs from the tool, if any. The associations from the CEIDs and VIDs will be made from the information in the report data from the tool.

It is not unusual for a tool to have no RPTIDs defined unless a fab host has been previously connected and has defined some reports already.



Characterization - RPTIDs

The screenshot shows the TransSECS software interface with a file explorer on the left displaying a tree structure under 'GEMHost'. The tree includes folders for 'CEIDs' (with sub-items COMPLETED, STARTED, LOADED) and 'RPTIDs', and a folder for 'VIDs' (with sub-items EventsEnabled, AlarmsSet, AlarmsEnabled, SpoolFullTime, SpoolStartTime, SpoolCountTotal, SpoolCountActual, and CLOCK). A dialog box titled 'Request Online VIDs First' is overlaid on the interface. The dialog contains a green question mark icon and the following text: 'If you have not already requested the online VIDs from the tool, press "Cancel" and request the VIDs before requesting reports. Missing VIDs will be discarded from report configurations.' The dialog has 'OK' and 'Cancel' buttons. A yellow callout box with a black border points to the 'Cancel' button, containing the text: 'After requesting RPTIDs from the tool, TransSECS will request that you have already obtained the VIDs and CEIDs before proceeding'.

TransSECS Build:12387 - GEMHost

File Edit Tools Help

GEMHost

- GEMHost
 - CEIDs
 - COMPLETED
 - STARTED
 - LOADED
 - RPTIDs
 - VIDs
 - EventsEnabled
 - AlarmsSet
 - AlarmsEnabled
 - SpoolFullTime
 - SpoolStartTime
 - SpoolCountTotal
 - SpoolCountActual
 - CLOCK

Request Online VIDs First

?

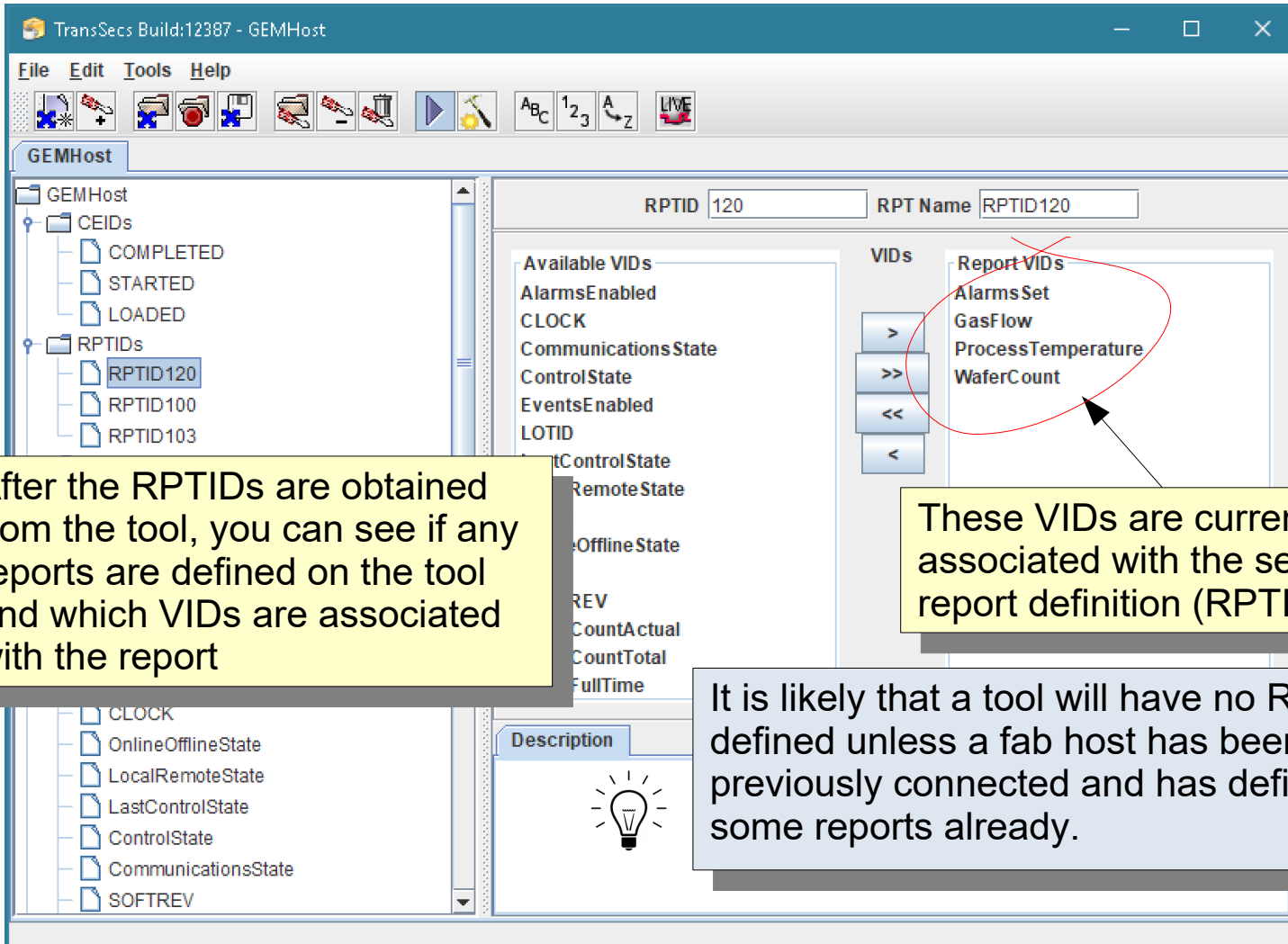
If you have not already requested the online VIDs from the tool, press "Cancel" and request the VIDs before requesting reports. Missing VIDs will be discarded from report configurations.

OK Cancel

After requesting RPTIDs from the tool, TransSECS will request that you have already obtained the VIDs and CEIDs before proceeding

ProcessTemperature

Characterization - RPTIDs



The screenshot shows the 'TransSecs Build:12387 - GEMHost' application window. The left sidebar displays a tree view with 'GEMHost' expanded to show 'RPTIDs', where 'RPTID120' is selected. The main area shows the configuration for 'RPTID 120' with 'RPT Name' set to 'RPTID120'. It features two lists: 'Available VIDs' and 'Report VIDs'. The 'Report VIDs' list includes 'AlarmsSet', 'GasFlow', 'ProcessTemperature', and 'WaferCount', which are circled in red. Navigation buttons (>, >>, <<, <) are positioned between the lists. A 'Description' tab at the bottom shows a lightbulb icon.

After the RPTIDs are obtained from the tool, you can see if any reports are defined on the tool and which VIDs are associated with the report

These VIDs are currently associated with the selected report definition (RPTID120)

It is likely that a tool will have no RPTIDs defined unless a fab host has been previously connected and has defined some reports already.

Report Definitions

It is likely that no reports (RPTIDs) are defined for your tool. This is normal unless RPTIDs were set up by a previous host connection or unless your tool has event messages pre-configured with reports.

With TransSECS, you can delete or edit existing RPTIDs or create new RPTIDs and associate these to events (CEIDs) and VIDs.

The next part of this Guide will show you how to set up RPTIDs and associate them with events from the tool.

For TransSECS GEM Projects, collecting the VIDs and CEIDs from the tool, then defining RPTIDs with the VIDs, and associating these RPTIDs with CEIDs (events) is the key to seamless data collection from the tool's event messages.

01100111



33.5
35.7
32.2
30.9
28.9

Defining RPTIDs

After the VIDs and CEIDs are obtained from the tool, you can add RPTIDs.

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

- GEMHost
 - CEIDs
 - RPT
 - Add RPTID
 - Online RPTIDs from Tool
 - Remove All RPTIDs
 - Sort By Name
 - Sort By Id
 - Sort By Name
 - Sort By Id
 - VIDs
 - CEID
 - ECID
 - ECID
 - ECID
 - ECID
 - Ena
 - EventReportRequest: S0F15
 - HostCommandPPSELECT: S2F41 W
 - HostCommandReply: S2F42
 - HostCommandSTART: S2F41 W
 - HostCommandSTOP: S2F41 W
 - IndividualReportData: S6F20
 - OfflineAck: S1F16
 - OnLineAck: S1F18
 - Request OffLine: S1F15 W
 - Request OnLine: S1F17 W
 - RequestedEventMessage: S6F16
 - RequestIndividualReport: S6F19 W
 - SVID List: S1F11 W
 - SVIDListReply: S1F12
 - SVIDRequest: S1F3 W
 - SVIDResponse: S1F4

Right-Click on the RPTID node to add a RPTID



Defining RPTIDs

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

RPTID -1 RPT Name RPTID0

Available VID's

- AlarmsEnabled
- AlarmsSet
- CLOCK

VIDs

Report VID's

A RPTID has been added with a default name "RPTID0"

LastControlState

LocalRemoteState

MDLN

OnlineOfflineState

PPID

ProcessTemperature

SOFTREV

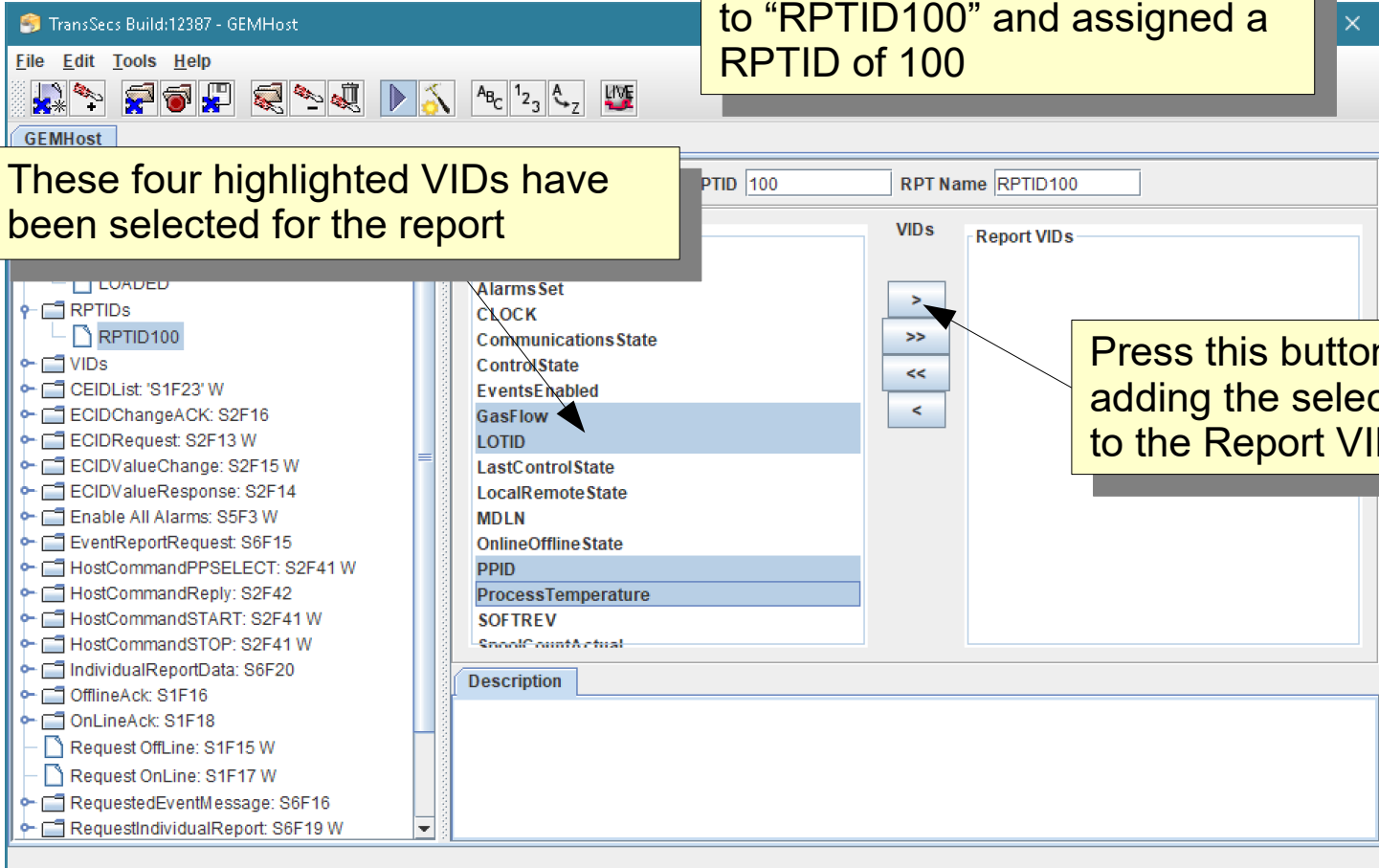
SpeedCountActual

Description

Defining RPTIDs

The RPTID has been renamed to "RPTID100" and assigned a RPTID of 100

These four highlighted VIDs have been selected for the report



TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

RPTID 100 RPT Name RPTID100

VIDs

Report VIDs

Alarms Set
CLOCK
Communications State
Control State
EventsEnabled
GasFlow
LOTID
LastControlState
LocalRemote State
MDLN
OnlineOffline State
PPID
ProcessTemperature
SOFTREV
SpoolCountActual

Description

Press this button to complete adding the selected VID items to the Report VIDs list



33.5
35.7
32.2
30.9
28.2

Defining RPTIDs

The screenshot shows the 'TransSecs Build:12387 - GEMHost' application window. The interface includes a menu bar (File, Edit, Tools, Help), a toolbar with various icons, and a tree view on the left. The tree view shows a hierarchy of folders: 'COMPLETED', 'STARTED', 'LOADED', 'RPTIDs', and 'VIDs'. Under 'RPTIDs', the folder 'RPTID100' is selected. The main area of the window is divided into several sections. At the top right, there is a field for 'RPT Name' containing 'RPTID100'. Below this, there are two columns: 'Available VIDs' and 'Report VIDs'. The 'Available VIDs' column lists various system parameters such as 'AlarmsEnabled', 'CLOCK', 'ControlState', 'EventsEnabled', 'LastControlState', 'LocalRemoteState', 'MDLN', 'OnlineOffline State', 'SOFTREV', 'SpoolCountActual', 'SpoolCountTotal', 'SpoolFullTime', 'SpoolStartTime', and 'WaferCount'. The 'Report VIDs' column lists 'GasFlow', 'LOTID', 'PPID', and 'ProcessTemperature'. Between these two columns are four arrow buttons: a downward arrow, a rightward arrow, a leftward arrow, and an upward arrow. A yellow callout box with the text 'The RPTID100 definition is complete' is overlaid on the top part of the interface. Another yellow callout box with the text 'Next we will associate this report with the LOADED event' is overlaid on the bottom part of the interface. The 'Description' field at the bottom is currently empty.



33.5
35.7
32.2
30.9
28.9

Defining RPTIDs

The screenshot shows the 'TransSecs Build:12387 - GEMHost' application window. The left sidebar contains a tree view with folders for 'GEMHost', 'CEIDs', 'RPTIDs', and 'VIDs'. Under 'CEIDs', there are sub-items 'COMPLETED', 'STARTED', and 'LOADED'. The 'LOADED' item is selected, and an arrow points to it from a yellow callout box. The main area shows the configuration for the selected CEID, with 'CEID Name' set to 'LOADED'. Below this, there are three panels: 'Available RPTIDs' containing 'RPTID100', 'RPTIDs' (empty), and 'Report IDs' (empty). A yellow callout box points to 'RPTID100' in the 'Available RPTIDs' list. At the bottom, there is a 'Description' field which is currently empty.

Select a CEID to be associated with one or more reports (RPTIDs)

We have one RPTID defined which is selected for this event



33.5
35.7
32.2
30.9
28.8

Defining RPTIDs

The event "LOADED" has one report (RPTID) assigned to it

TransSecs Build:12387 - GEMHost

File Edit Tools Help

GEMHost

- GEMHost
 - CEIDs
 - COMPLETED
 - STARTED
 - LOADED
 - RPTIDs
 - RPTID100
 - VIDs
 - CEIDList: 'S1F23' W
 - ECIDChangeACK: S2F16
 - ECIDRequest: S2F13 W
 - ECIDValueChange: S2F15 W
 - ECIDValueResponse: S2F14
 - Enable All Alarms: S5F3 W
 - EventReportRequest: S6F15
 - HostCommandPPSELECT: S2F41 W
 - HostCommandReply: S2F42
 - HostCommandSTART: S2F41 W
 - HostCommandSTOP: S2F41 W
 - IndividualReportData: S6F20
 - OfflineAck: S1F16
 - OnLineAck: S1F18
 - Request OffLine: S1F15 W
 - Request OnLine: S1F17 W
 - RequestedEventMessage: S6F16
 - RequestIndividualReport: S6F19 W

CEID 7503 CEID Name LOADED

Available RPTIDs

RPTIDs

Report IDs

RPTID100

Description

Multiple RPTIDs may be selected and added to the Report IDs list for any event

01100111



33.5
35.7
32.2
30.9
28.9

Defining RPTIDs

Rebuild the project to generate the code for the characterization data

The screenshot shows the TransSECS software interface. On the left is a project tree for 'GEMHost' containing folders for CEIDs, RPTIDs, and various VID definitions. The main window displays a 'Description' tab for a selected item. A 'Compilation' dialog box is open in the foreground, displaying the message 'Building All Files' and a 'Cancel' button. A yellow callout box with the text 'Press the hammer/star button to rebuild' points to a hammer and star icon in the software's toolbar.

Report Data

The data (VIDs) you have added to the RPTIDs will become available to your host application when a report (S6F11) is received from the tool.

Each TransSECS deployment Guide will have more details on the specifics of how this VID data is accessed.

For example, for Servers TransSECS, the data will be published as variables in the MQTT broker or available as OPCUA Server variable data items. For Devices TransSECS, the data will be pushed to the associated PLC register for that VID or available for scripting.

That's it.

To characterize your tool, start with the GEMHost project, remove all the VIDs, CEIDs, and RPTIDs using right-click, "Remove All". Re-add the empty nodes for VIDs, CEIDs, and RPTIDs by right-clicking on the project node. Configure the connection parameters, build the host in TransSECS, and connect to the tool by toggling from SIM to LIVE. Right-Click on the VIDs node and use "Online VIDs from Tool" to get all the VIDs from the tool. Likewise, use "Online CEIDs from Tool" to get all the CEIDs, and then "Online RPTIDs from Tool" to get the RPTIDs, if any, from the tool.

Please let us know if you have any questions!