

SCILA

Firmware Command Set

Version: 1.03

INHECO GmbH
Fraunhoferstr. 11
82152 Martinsried

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Contact Data:

Address	Fraunhoferstr. 11 82152 Martinsried Germany
Telephone - Sales	+49 89 899593 101
Fax	+49 89 899593 149
E-Mail - Sales	sales@inheco.com
E-Mail - Technical -Hotline	techhotline@inheco.com
Website	www.inheco.com

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1 Introduction

The INHECO SCILA device implements a SiLA Service Provider according to the SiLA Device Control & Data Interface Specification version 1.2. The INHECO SCILA device implements the SiLA Device class Incubator (ID 8). The Web Service Description Language (WSDL) file of the SiLA interface is available for download directly from the INHECO SCILA device: <http://<ip-of-device>/scila.wsdl>.

The INHECO SCILA device provides the following command set over SiLA interface:

SiLA Command Set	Mandatory Commands	Required	Optional	Specific Commands
		Common Commands		
Abort	x			
BoostCO2				x
CloseDoor			x	
Delay			x	
DoContinue	x			
GetAutoBoostCO2				x
GetCO2FlowStatus				x
GetConfiguration			x	
GetDoorStatus				x
GetParameters		x		
GetDeviceIdentification	x			
GetLiquidLevel				x
GetStatus	x			
GetTemperature				x
GetValveStatus				x
Initialize	x			
LockDevice	x			
Maintenance				x
OpenDoor			x	
Pause	x			
PrepareForInput			x	
PrepareForOutput			x	
Reset	x			
RetrieveByPositionId		x		
SetAutoBoostCO2				x
SetConfiguration			x	
SetCO2NormalFlow				x
SetParameters		x		
SetTemperature				x
StoreAtPosition		x		
UnlockDevice	x			

For documentation about SiLA Mandatory Commands see → “**SiLA Device Control & Data Interface Specification v1.2**” document.

For documentation about SiLA Common Commands see → “**SiLA Command Dictionary Specification**” document.

Additionally, there is a Non-SiLA Web Service interface available for device monitoring.

See → 12.1 IHC Web Service Interface

2 SiLA Command Processing States

The table shows the ability if a command is executable in the respective SiLA state.
The SiLA state "ErrorHandling" is not used.

Command ID	SiLA States						
	Startup	Resetting	Standby	Paused	Idle	Busy ¹	InError
Abort				x	x	x	
BoostCO2					x	x	
CloseDoor					x	x	
Delay					x	x	
DoContinue				x			
GetAutoBoostCO2					x	x	
GetCO2FlowStatus					x	x	
GetConfiguration			x				
GetDoorStatus					x	x	
GetParameters					x	x	
GetDeviceIdentification	x	x	x	x	x	x	x
GetLiquidLevel					x	x	
GetStatus	x	x	x	x	x	x	x
GetTemperature					x	x	
GetValveStatus					x	x	
Initialize			x				
LockDevice			x				
Maintenance					x	x	
OpenDoor					x	x	
Pause					x	x	
PrepareForInput					x	x	
PrepareForOutput					x	x	
Reset	x	x	x	x	x	x	x
RetrieveByPositionId					x	x	
SetAutoBoostCO2					x	x	
SetConfiguration			x				
SetCO2NormalFlow					x	x	
SetParameters					x	x	
SetTemperature					x	x	
StoreAtPosition					x	x	
UnlockDevice			x				

¹ Command processing ability in state Busy may differ for parallel command invocation.
See → 3 Processing Device Command Behavior

[illegible]

4 SiLA Return Value

The SiLA Return Value data type is part of every response and event sent by the INHECO SCILA device.

SiLA Return Value	
returnCode	Int32
message	String
duration	Duration
deviceClass	Int32

The value range from 1 to 999 of parameter 'returnCode' is reserved by SiLA standard. The INHECO SCILA device will use the values from 1000 and higher to indicate issues like warnings and errors.

Error Type	ReturnCode Value Ranges
Info	1750 – 1999
	5000 – 5999
Warning	1500 – 1749
	4000 – 4999
Error	1250 – 1499
	3000 – 3999
DeviceError	1000 – 1249
	2000 – 2999

4.1 Error Classification

Type	Description
Info	Internal logging purposes only. Infos will not be forwarded by device over SiLA interface.
Warning	Warnings should inform the user about minor device issues while runtime and after processing. Warnings could be ignored by the SiLA PMS.
Error	A Error stops current command processing. The device will stay in an operable state.
DeviceError	A DeviceError will result in a non-operable device state. The device will switch into SiLA InError state. Only in case of an "EventError" (returnCode 1001) it is possible to get into an operable state again by using the Reset command. In all other cases a power cycle is required to get back into an operable state.

4.2 Device specific ReturnCodes

return Code	Message	Classification	Correction Hints	Description
1000	InternalSoftwareError	DeviceError	Contact service. See InhecoSiLA.log for details.	A not further specified serious software error has occurred.
1001	EventError	DeviceError	Invoke SiLA command Reset. Contact service. See InhecoSiLA.log for details.	A serious error during sending ResponseEvent to EventReceiver or receiving Response of ResponseEvent from EventReceiver has occurred.
1002	CommandError	DeviceError	Contact service. See InhecoSiLA.log for details.	A serious error related to SiLA commands has occurred.
2000	Hardware error during operation	DeviceError	Contact service.	A serious hardware error has occurred.
2001	EPC failure during operation	DeviceError	Contact service. See InhecoSiLA.log for details.	Error Response of EventReceiver or Exceptions of SiLA Events or Plugin Errors.
2002	Device plugin error	DeviceError	Contact service.	A serious software error at device plugin has occurred.
2003	Bus error	DeviceError	Contact service. Power cycle device.	A serious software error at internal bus has occurred.
2004				
2007	Main voltage lost	DeviceError	No reaction necessary.	Main voltage(90-230V) loss, e.g. device switched off.
3001	Command not accepted	CommandError	Power cycle device.	A software error related to internal command set occurred.
3002	Drawer error	CommandError	Check drawer for external blocking.	Closing/Opening drawer failure. Drawer didn't close/opened in expected time.
3003	Drawer error	CommandError	Use SiLA PrepareForInput / PrepareForOutput to specify drawer position.	No valid drawer position specified.
3004	Drawer error	CommandError	Mount and close all drawers and retry OpenDoor.	Opening multiple drawers at same time is not allowed.
3005	Drawer error	CommandError	Mount drawer and retry.	The drawer is pulled out.
1500	General warning	Warning	Contact service. See InhecoSiLA.log for details.	A not further specified warning has occurred.
4000	General warning	Warning	Contact service.	A not further specified warning has occurred.
4001	Empty Liquid Level warning	Warning	Refill water.	The water reservoir is empty.
4002	Low Liquid Level warning	Warning	Refill water.	The water reservoir is nearly empty.
4003	High Liquid Level warning	Warning	Remove water.	The water reservoir is overfilled.
4004	Temperature out of specification	Warning	User should be informed that there is a temperature deviation between set temperature and real temperature.	Deviation between set and measured temperature is too large.
4005	Ambient Temperature warning	Warning	Check air flow.	Ambient temperature too high.
4006	CO2 Flow warning	Warning	Check CO2 pressure.	The CO2 flow is too low or too high.
4007	CO2 Zero Flow warning	Warning	Contact service.	Flow rate of closed CO2 valve is too high.
4008	Door Temperature warning	Warning	Contact service.	Door temperature sensor does not respond.
4009	Door Monitoring Temperature warning	Warning	Contact service.	Door monitoring temperature sensor does not respond.
4010	Unexpected Liquid Level warning	Warning	Contact service.	The liquid level value is not defined.
4011	Fan warning	Warning	Contact service.	Fan failure.
4012	Drawer Motor warning	Warning	Contact service.	Drawer motor-IC short cut or overtemperature.
4020	SDCard warning	Warning	Insert SDCard correctly and power cycle the device.	No µSD-Card is inserted. The card is required for writing log and trace files.
4021	Maintenance warning	Warning	Power cycle device.	The device will power off after completing command Maintenance.

5 Device Management

For device management the following commands are available:

- SetConfiguration (Parameter: configXML)
 - SysDateTime
 - NetworkConfig
 - SoapCompression
 - UseDeviceClassDateTime
 - LogLevel
- GetConfiguration
 - SysDateTime
 - NetworkConfig
 - SoapCompression
 - UseDeviceClassDateTime
 - LogLevel
- SetParameters (Parameter: paramsXML)
 - Position
 - WorkstationMode
- GetParameters
 - Position
 - WorkstationMode

5.1 SetConfiguration

The SetConfiguration command is used to set the configuration of a device. This command can only be executed in the SiLA state Standby.

Estimated Duration	5s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

5.1.1 Parameters

Name	Data type	Restrictions	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
configLevel	Int32	[1; 2.147.483.647]		True
password	String			True
configXML	String (ParameterSet)			False

5.1.1.1 Parameter: configLevel

This parameter is defining the access level.

Parameter configLevel is not used.

5.1.1.2 Parameter: password

This parameter contains the password for the corresponding configLevel.

Parameter password is not used.

5.1.1.3 Parameter: configXML

Parameter configXML contains configuration parameters formatted as XML. It has to be composed according to SiLA → ResponseType_1.2.xsd XML schema file. The possible XML root elements are <ParameterSet> for transmitting at least one or multiple configuration parameters or <Value> for a single parameter.

```
<ParameterSet>
  <Parameter parameterType="xxx" name="yyy">
    <xxx>zzz</xxx>
  </Parameter>
  ...
</ParameterSet>
```

```
<Value parameterType="xxx" name="yyy">
  <xxx>zzz</xxx>
</Value>
```

Available parameter:

Parameter name	Type
SysDateTime	DateTime
NetworkConfig	String (XMLDocument)
SoapCompression	Boolean
UseDeviceClassDateTime	Boolean
LogLevel	String

Example 1:

```
<ParameterSet>
  <Parameter parameterType="DateTime" name="SysDateTime">
    <DateTime>2014-01-01T15:20:00Z</DateTime>
  </Parameter>
  <Parameter name="NetworkConfig">
    <String>&lt;Network&gt;&lt;StaticIPv4&gt;&lt;IP&gt;10.0.1.129&lt;/IP&gt;&lt;Subnet&gt;255.255.255.128&lt;/Subnet&gt;&lt;Gateway&gt;10.0.1.254&lt;/Gateway&gt;&lt;DNS&gt;10.0.0.1&lt;/DNS&gt;&lt;DNS&gt;10.0.0.2&lt;/DNS&gt;&lt;/StaticIPv4&gt;&lt;/Network&gt;</String>
  </Parameter>
  <Parameter name="LogLevel">
    <String>DEBUG</String>
  </Parameter>
</ParameterSet>
```

Example 2:

```
<Value name="NetworkConfig">
  <String>&lt;Network&gt;&lt;DHCP/&gt;&lt;/Network&gt;</String>
</Value>
```

5.1.1.3.1 SysDateTime

Parameter name	Type	Restrictions	Default
SysDateTime	DateTime		

Setting the system date, time and time zone of the device in XML DateTime format.

For further information about the XML type DateTime see:

→ <http://www.w3.org/TR/xmlschema-2/#dateTime>

5.1.1.3.2 NetworkConfig

Parameter name	Type	Restrictions	Default
NetworkConfig	String (XMLDocument)		DHCP (Auto IP)

A device power cycle is required to apply network mode or network configuration.

It's possible to switch between the two IPv4 network operation modes DHCP and static IP configuration. By default, DHCP mode is enabled.

When the DHCP mode is enabled, the device attempts to locate a DHCP server and obtain a configuration from the server. Most corporate TCP/IP networks use DHCP servers that have been administratively configured to hand out information to the clients on the network. If an attempt to locate a DHCP server fails, the DHCP client auto configures the stack with a LINKLOCAL address of 169.254.0.0 with the subnet mask 255.255.0.0. This process is called Automatic IP (Auto IP). The DHCP client will test, using a gratuitous ARP, to be sure that the IP address the client has chosen is not already in use. If the address is in use, the client selects another IP address. The client repeats this selection process for up to ten addresses. Once the DHCP client has selected an address that is verifiably not in use, the client configures the interface with this address. The client continues to check for a DHCP server in the background every 5 minutes. If a DHCP server is found, the auto configuration information is abandoned and the configuration offered by the DHCP server is used instead.

When static IP mode is enabled, the device will always use the given IP configuration. For a most stable network configuration it is recommended to use static IP mode.

NetworkConfig XML schema definition

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema id="Network" xmlns:xs="http://www.w3.org/2001/XMLSchema" version="1.0">
  <xs:element name="Network" type="NetworkType" />
  <xs:complexType name="NetworkType">
    <xs:sequence>
      <xs:choice>
        <xs:element name="DHCP" type="DHCPIPv4Type" minOccurs="1"/>
        <xs:element name="StaticIPv4" type="StaticIPv4Type"
minOccurs="1" />
      </xs:choice>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="StaticIPv4Type">
    <xs:sequence>
      <xs:element name="IP" type="IPtype" minOccurs="1" maxOccurs="1"/>
      <xs:element name="Subnet" type="IPtype" minOccurs="1"
maxOccurs="1"/>
      <xs:element name="Gateway" type="IPtype" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="DNS" type="IPtype" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="DHCPIPv4Type">
    <xs:sequence>
      <xs:element name="IP" type="IPtype" minOccurs="0" maxOccurs="1"/>
      <xs:element name="Subnet" type="IPtype" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="Gateway" type="IPtype" minOccurs="0"
maxOccurs="1"/>
      <xs:element name="DNS" type="IPtype" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
  </xs:complexType>
  <xs:simpleType name="IPtype">
    <xs:restriction base="xs:string">
      <xs:pattern value="((([2] [0-5] [0-5]) | ([0-1] [0-9] [0-9]) | \d{2} | \d{1}) \. (([2] [0-5] [0-5]) | ([0-1] [0-9] [0-9]) | \d{2} | \d{1}) \. (([2] [0-5] [0-5]) | ([0-1] [0-9] [0-9]) | \d{2} | \d{1}) \. (([2] [0-5] [0-5]) | ([0-1] [0-9] [0-9]) | \d{2} | \d{1}) )"/>
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

Static IP Configuration

Static IP configuration requires at least IP- and Subnet-Address information. The default Gateway- and DNS-Address are optional.

Example XML:

```
<Network>
  <StaticIPv4>
    <IP>10.0.1.129</IP>
    <Subnet>255.255.255.128</Subnet>
    <Gateway>10.0.1.254</Gateway>
    <DNS>10.0.0.1</DNS>
    <DNS>10.0.0.2</DNS>
  </StaticIPv4>
</Network>
```

Auto IP configuration

A Dynamic Host Control Protocol (DHCP) server is required for automatic (dynamic) IP assignment.

Example XML:

```
<Network>
  <DHCP/>
</Network>
```

5.1.1.3.3 SoapCompression

Parameter name	Type	Restrictions	Default
SoapCompression	Boolean		False

A device power cycle is required to apply SoapCompression configuration.

Enables or disables HTTP GZIP compression support of INHECO SCILA device.

True: Compression support enabled

False: Compression support disabled

GZIP compression must also be supported by the SiLA PMS to work. A request of the SiLA Service Consumer must indicate GZIP support in the HTTP Header. This is done by "Accept-Encoding" header with GZIP flag. Only if both the SoapCompression support of INHECO SCILA device is enabled and the client sends the GZIP supported flag, GZIP compressed synchronous response (HTTP response) will be sent.

Receiving compressed HTTP requests is not supported by INHECO SCILA device.

HTTP GZIP compression of SiLA Events is not supported by INHECO SCILA device.

Example HTTP request:

```
POST / HTTP/1.1
Content-Type: text/xml; charset=utf-8
SOAPAction: "http://sila.coop/Reset"
Host: 10.1.22.4:8080
Content-Length: 476
Expect: 100-continue
Accept-Encoding: gzip, deflate

<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/"><s:Body><Reset
xmlns="http://sila.coop" xmlns:i="http://www.w3.org/2001/XMLSchema-
instance"><requestId>519394860</requestId><lockId i:nil="true"/><deviceId>56aeb91e-68ae-
4659-a688-
5ff9f1667516</deviceId><eventReceiverURI>http://10.1.22.100:7071/ihc</eventReceiverURI><PM
SId>http://10.1.22.100:7071/ihc</PMSId><errorHandlingTimeout
i:nil="true"/><simulationMode>false</simulationMode></Reset></s:Body></s:Envelope>
```

Example compressed HTTP response:

```
HTTP/1.1 200 OK
Server: gSOAP/2.8
X-Frame-Options: SAMEORIGIN
Content-Type: text/xml; charset=utf-8
Content-Encoding: gzip
Transfer-Encoding: chunked
Connection: close

128
.....n.0.E.H...{b...#....Th..e...d&.8....m..E..<.....P...*v.31.G".4d..f.}.8....
...z.z.HV...J...t.Ld...12(4..f.eL.N...?.....?w.3z`w.....S.d4.....i..C..
.....
.f`(6Tt...].C.P..=.=...7`.a(.....mY..+\...5I.U.....h...j.B.B...1Pz.q.u...u.}xI...7.w.
Z...2..jz2/....'o. .P.|
u7..
```

(Content: 523 Bytes)

Example uncompressed HTTP response:

```
HTTP/1.1 200 OK
Server: gSOAP/2.8
X-Frame-Options: SAMEORIGIN
Content-Type: text/xml; charset=utf-8
Content-Encoding: gzip
Transfer-Encoding: chunked
Connection: close

<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-
ENC="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:i="http://inheco.com"
xmlns:s="http://sila.coop"><SOAP-
ENV:Body><s:ResetResponse><s:ResetResult><s:returnValue>2</s:returnValue><s:message>Asynchro
nous
command
accepted.</s:message><s:duration>PT1S</s:duration><s:deviceClass>8</s:deviceClass></s:Rese
tResult></s:ResetResponse></SOAP-ENV:Body></SOAP-ENV:Envelope>
```

(Content: 795 Bytes)

5.1.1.3.4 UseDeviceClassDateTime

Parameter name	Type	Restrictions	Default
UseDeviceClassDateTime	Boolean		False

Enables or disables usage of parameter “deviceClass” of SiLA data type “SiLAReturnValue” as Date and Time parameter. If enabled the Device Class of type Int32 will be used as a Unix-Time value of the current device time. Unix time is defined as the number of seconds that have elapsed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January 1970.

True: Enabled

False: Disabled (Use device specific device class)

Important Note

Enabling this option may cause incompatibility to SiLA drivers. Check if your SiLA driver relies on correct SiLA Device Class values of SiLAReturnValue.

5.1.1.3.5 LogLevel

Parameter name	Type	Restrictions	Default
LogLevel	String	DEBUG, INFO, WARN, ERROR, FATAL	INFO

Change this parameter only if advised by INHECO support.

5.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

5.2 GetConfiguration

The GetConfiguration command is used to receive the configuration of a device. It can only be invoked in the standby state.

Estimated Duration	5s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

5.2.1 Parameters

Name	Data type	Restrictions	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
configLevel	Int32	[1; 2.147.483.647]		True
password	String			True

5.2.1.1 ConfigLevel

This parameter is defining the access level.

Parameter configLevel is not used.

5.2.1.2 Password

This parameter contains the password for the corresponding configLevel.

Parameter password is not used.

5.2.2 ResponseData

Response Type	standardResponse
ParameterSet Count	1

The ParameterSet contains configuration parameters for the INHECO SCILA device.

Parameter	Data type
SysDateTime	DateTime
NetworkConfig	String
SoapCompression	Boolean
UseDeviceClassDateTime	Boolean
LogLevel	String

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="SysDateTime">
      <DateTime>2016-08-23T14:37:44Z</DateTime>
    </Parameter>
    <Parameter name="NetworkConfig">
      <String>&lt;Network&gt;&lt;DHCP&gt;&lt;/DHCP&gt;&lt;/Network&gt;</String>
    </Parameter>
    <Parameter name="SoapCompression">
      <Boolean>false</Boolean>
    </Parameter>
    <Parameter name="UseDeviceClassDateTime">
      <Boolean>false</Boolean>
    </Parameter>
    <Parameter name="LogLevel">
      <String>INFO</String>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

5.2.2.1 Parameter: SysDateTime

→ 5.1.1.3.1 SysDateTime

Example 1:

```
<ParameterSet>
  <Parameter parameterType="DateTime" name="SysDateTime">
    <DateTime>2014-01-01T15:20:00Z</DateTime>
  </Parameter>
  <Parameter name="NetworkConfig">
    <String>&lt;Network&gt;&lt;StaticIPv4&gt;&lt;IP&gt;10.0.1.129&lt;/IP&gt;&lt;Subnet&gt;255.255.255.128&lt;/Subnet&gt;&lt;Gateway&gt;10.0.1.254&lt;/Gateway&gt;&lt;DNS&gt;10.0.0.1&lt;/DNS&gt;&lt;DNS&gt;10.0.0.2&lt;/DNS&gt;&lt;/StaticIPv4&gt;&lt;/Network&gt;</String>
  </Parameter>
  <Parameter name="LogLevel">
    <String>DEBUG</String>
  </Parameter>
</ParameterSet>
```

Example 2:

```
<Value name="NetworkConfig">
  <String>&lt;Network&gt;&lt;DHCP&/&gt;&lt;/Network&gt;</String>
</Value>
```

5.2.2.2 Parameter: NetworkConfig

→ 5.1.1.3.2 NetworkConfig

5.2.2.3 Parameter: SoapCompression

→ 5.1.1.3.3 SoapCompression

5.2.2.4 Parameter: UseDeviceClassDateTime

→ 5.1.1.3.4 UseDeviceClassDateTime

5.2.2.5 Parameter: LogLevel

→ 5.1.1.3.5 LogLevel

5.3 SetParameters

The SetParameters command is used to set device specific parameters within the state idle so that the new values are used for the next command invocation. Only the parameters that need to be changed have to be transmitted to the device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

5.3.1 Parameters

Name	Data type	Restrictions	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
paramsXML	String (XMLDocument)			False

5.3.1.1 Parameter: paramsXML

Parameter paramsXML contains configuration parameters formatted as XML. It has to be composed according to SiLA → ResponseType_1.2.xsd XML schema file. The possible XML root elements are <ParameterSet> for transmitting at least one or multiple configuration parameters or <Value> for a single parameter.

```
<ParameterSet>
  <Parameter parameterType="xxx" name="yyy">
    <xxx>zzz</xxx>
  </Parameter>
  ...
</ParameterSet>
```

```
<Value parameterType="xxx" name="yyy">
  <xxx>zzz</xxx>
</Value>
```

Available parameter:

Parameter name	Type
Position	Int32
WorkstationMode	Boolean

Example 1:

```
<ParameterSet>
  <Parameter name="Position">
    <Int32>1</Int32>
  </Parameter>
</ParameterSet>
```

Example 2:

```
<Value name="WorkstationMode">
  <Boolean>true</Boolean>
</Value>
```

5.3.1.1.1 Position

Parameter name	Type	Restrictions	Default
Position	Int32	[1; 4]	0

For opening or closing a drawer it's required to specify the drawer position first and afterwards it's possible to open or close a drawer by the SiLA commands OpenDoor and CloseDoor. See → **6 Drawer Control**

5.3.1.1.2 WorkstationMode

Parameter name	Type	Restrictions	Default
WorkstationMode	Boolean		False

Enables or disables the WorkstationMode support. When WorkstationMode is disabled and a SiLA Reset command is invoked, the INHECO SCILA device will perform the protocol reset and additionally stops temperature control. This behavior may be desired in a high available fully automated environment. If WorkstationMode is enabled a SiLA Reset command invocation does not stop temperature control.

The value of WorkstationMode is stored persistently over device power cycle.

True: Enabled

False: Disabled

5.3.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

5.4 GetParameters

The GetParameters command is used to report actual parameter names and values to the PMS.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

5.4.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]	-	False
lockId	String	(XML-characters)	-	True

5.4.2 ResponseData

Response Type	standardResponse
ParameterSet Count	1

The ParameterSet contains configuration parameters for the INHECO SCILA device.

Parameter	Data type
Position	Int32
WorkstationMode	Boolean

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="Position">
      <Int32>0</Int32>
    </Parameter>
    <Parameter name="WorkstationMode">
      <Boolean>false</Boolean>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

5.4.2.1 Parameter: Position

→ 5.3.1.1.1 Position

5.4.2.2 Parameter: WorkstationMode

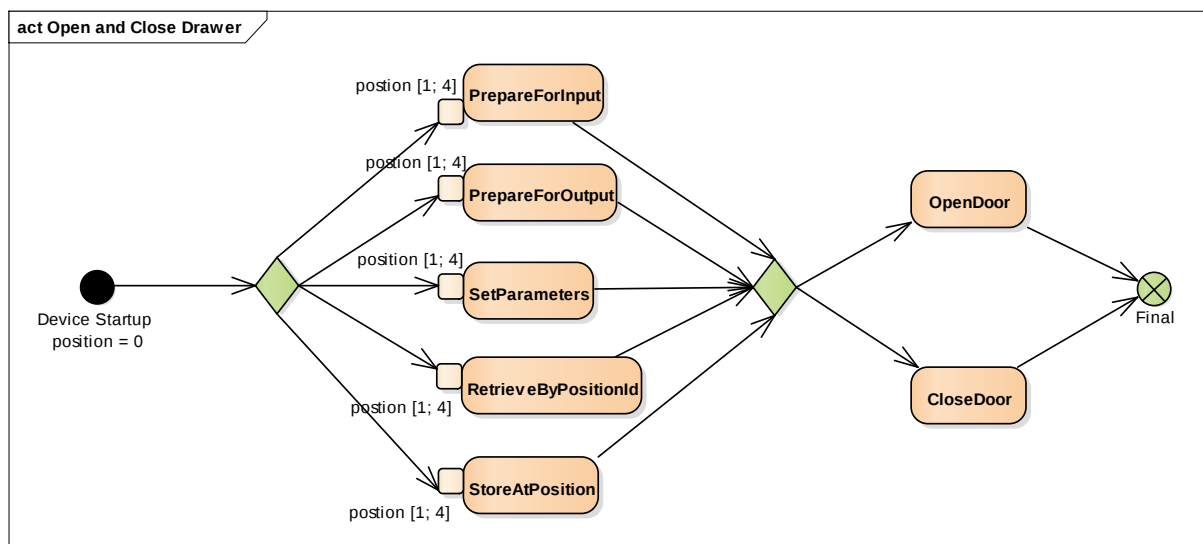
→ 5.3.1.1.2 WorkstationMode

6 Drawer Control

For drawer control the following commands are available:

- PrepareForOutput, PrepareForInput
- OpenDoor, CloseDoor
- GetDoorStatus
- SetParameters
- RetrieveByPositionId, StoreAtPosition

For opening or closing a drawer it's required to specify the drawer position first and afterwards it's possible to open or close a door by the SiLA commands OpenDoor and CloseDoor. The drawer position specification is done by one of the following SiLA commands: PrepareForInput, PrepareForOutput, RetrieveByPositionId, StoreAtPosition or SetParameters. Each of that commands have a parameter 'position' with a value range of 1 to 4 which represents the four drawer doors. Position 1 is the lowest and position 4 is the highest drawer door. The position parameter is stored at the device until it gets manually changed or by a power cycle, which means the position value is set back to default value 0 (unspecified). The current value of the parameter position can be retrieved by the SiLA command GetParameters.



With drawer control it's not possible to open more than one door at the same time. See → **11.2 Maintenance** for opening all drawer doors.

6.1 PrepareForInput

The PrepareForInput command is used to specify a drawer position for opening or closing a drawer with SiLA command OpenDoor or CloseDoor.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
position	Int32	[1; 4]		True

6.1.1.1 Parameter: position

Parameter position is used to specify a drawer position. There are four positions where position 1 is the lowest and position 4 is the highest. Setting the position value NULL will select drawer unspecified.

6.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

6.2 PrepareForOutput

The PrepareForOutput command is used to specify a drawer position for opening or closing drawer with SiLA command OpenDoor or CloseDoor.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.2.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
position	Int32	[1; 4]		True

6.2.1.1 Parameter: position

Parameter position is used to specify a drawer position. There are four positions where position 1 is the lowest and position 4 is the highest. Setting the position value NULL will select drawer unspecified.

6.2.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

6.3 OpenDoor

The OpenDoor command opens a drawer of the INHECO SCILA device. The position of the drawer to open is specified by one of the commands: PrepareForInput, PrepareForOutput, RetrieveByPositionId, StoreAtPosition or SetParameters.

The last specified position is cached until device power cycle.

Estimated Duration	8s
Simulation Mode	Not supported
Pausable	No

The physical opening drawer process is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.3.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

6.3.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

6.4 CloseDoor

The CloseDoor command closes a drawer of the INHECO SCILA device. The position of the drawer to close is specified by one of the commands: PrepareForInput, PrepareForOutput, RetrieveByPositionId, StoreAtPosition or SetParameters.

The last specified position is cached until device power cycle.

Estimated Duration	8s
Simulation Mode	Not supported
Pausable	No

The physical closing drawer process is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.4.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

6.4.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

6.5 GetDoorStatus

The GetDoorStatus command is used to receive the current status of all drawers.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.5.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

6.5.2 ResponseData

ResponseType	standardResponse
ParameterSetCount	1

The ParameterSet contains the current door status of each drawer position: Door1, Door2, Door3, Door4

Parameter	Data type
Position	Int32
Door1	String (Enum)
Door2	String (Enum)
Door3	String (Enum)
Door4	String (Enum)

Possible values of status:

- PulledOut
- Opened
- Closed
- Moving

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="Position">
      <Int32>0</Int32>
    </Parameter>

    <Parameter name="Door1">
      <String>Closed</String>
    </Parameter>
    <Parameter name="Door2">
      <String>Closed</String>
    </Parameter>
    <Parameter name="Door3">
      <String>Closed</String>
    </Parameter>
    <Parameter name="Door4">
      <String>Closed</String>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

6.6 RetrieveByPositionId

The RetrieveByPositionId command is used to specify a drawer position for opening or closing a drawer with SiLA command OpenDoor or CloseDoor.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.6.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
position	Int32	[1; 4]		False
labwareType	String (XMLdocument)			True

6.6.1.1 Parameter: position

Parameter position is used to specify a drawer position. There are four positions where position 1 is the lowest and position 4 is the highest.

6.6.1.2 Parameter: labwareType

Parameter labwareType is not used.

6.6.2 ResponseData

ResponseType	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

6.7 StoreAtPosition

The StoreAtPosition command is used to specify a drawer position for opening or closing a drawer with SiLA command OpenDoor or CloseDoor.

Estimated Duration	1s
Not supported	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

6.7.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
position	Int32	[1; 4]		False
labwareType	XML			True

6.7.1.1 Parameter: position

Parameter position is used to specify a drawer position. There are four positions where position 1 is the lowest and position 4 is the highest.

6.7.1.2 Parameter: labwareType

Parameter labwareType is not used.

6.7.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

7 Temperature Control

- GetTemperature
- SetTemperature

7.1 SetTemperature

The SetTemperature command is used for setting the target temperature and/or enable or disable the temperature control of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

7.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	1; 2.147.483.647]		False
lockId	String			True
targetTemperature	Float64	[15; 45]	37	True
temperatureControl	Boolean			True

7.1.1.1 Parameter: targetTemperature

Parameter targetTemperature sets the target temperature of incubation chamber of the INHECO SCILA device in range between 15 to 45 [°C] in 1/100 steps. Additional decimal places get truncated. After device power cycle the default temperature is 37°C.

When the parameter value is NULL this parameter will be ignored and the current value doesn't get changed.

7.1.1.2 Parameter: temperatureControl

Parameter temperatureControl enables or disables the temperature regulation of the INHECO SCILA device.

True: Enabled
False: Disabled

When the parameter value is NULL this parameter will be ignored and the current status doesn't get changed.

7.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

7.2 GetTemperature

The GetTemperature command is used for getting the current temperature of incubation chamber, the target temperature and the status of the temperature control of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

7.2.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	1; 2.147.483.647]		False
lockId	String			True

7.2.2 ResponseData

Response Type	standardResponse
ParameterSet Count	1

The ParameterSet contains parameter for current and target temperature in [°C] and status of temperature control.

Parameter	Data type
CurrentTemperature	Float64
TargetTemperature	Float64
TemperatureControl	Boolean

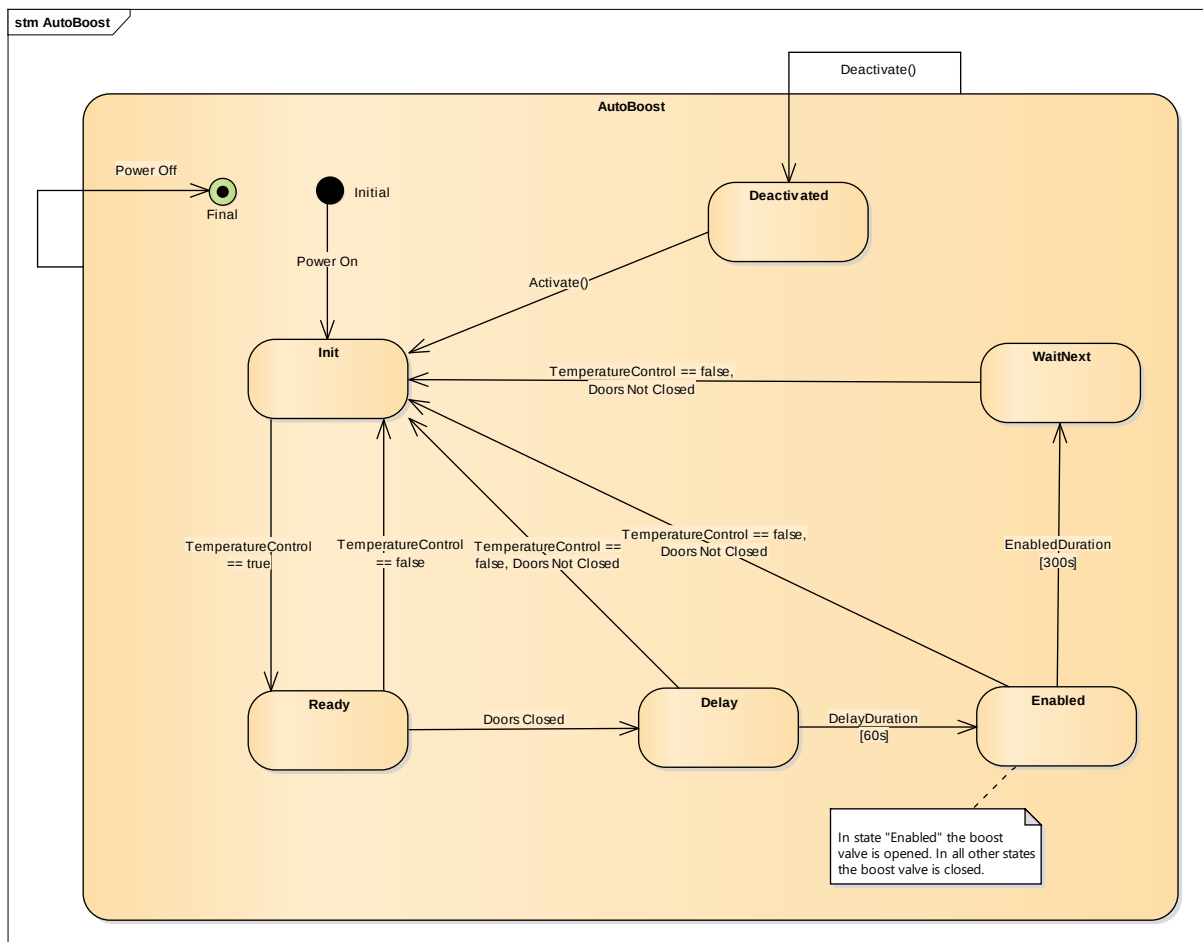
Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="CurrentTemperature">
      <Float64>28.16</Float64>
    </Parameter>
    <Parameter name="TargetTemperature">
      <Float64>37</Float64>
    </Parameter>
    <Parameter name="TemperatureControl">
      <Boolean>false</Boolean>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

8 Gas Control

- SetAutoBoostCO2
- GetAutoBoostCO2
- BoostCO2
- GetCO2FlowStatus
- SetCO2NormalFlow
- GetValveStatus

AutoBoost State Machine



8.1 SetAutoBoostCO2

The SetAutoBoostCO2 command is used to activate or deactivate the AutoBoostCO2 functionality of the INHECO SCILA device. AutoBoostCO2 is active by default.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

8.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
autoBoostCo2	Boolean			False

8.1.1.1 Parameter: autoBoostCo2

Parameter autoBoostCo2 is used to activate or deactivate the autoBoostCo2 functionality. The value is stored persistently and after power cycle the INHECO SCILA device will use the last state. By default, the value is 'True'.

True: Active

False: Inactive

8.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

8.2 GetAutoBoostCO2

The GetAutoBoostCO2 command is used for getting the current status of the AutoBoostCO2 functionality of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

8.2.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

8.2.2 ResponseData

Response Type	standardResponse
ParameterSet Count	1

The ParameterSet contains parameter for the status of the AutoBoostCO2 functionality and the BoostState state machine.

Parameter	Data type
AutoBoostCO2	Boolean
BoostState	String (Enum)

BoostState enum values:

- Init
- Ready
- Delay
- Enabled
- WaitNext
- Deactivated

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="AutoBoostCO2">
      <Boolean>true</Boolean>
    </Parameter>
    <Parameter name="BoostState">
      <String>Init</String>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

8.3 BoostCO2

The BoostCO2 command is used to manually active or deactivate CO2 boost valve.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

8.3.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
boostDuration	unsignedShort	0, [1200; 6000]		False

8.3.1.1 Parameter: boostDuration

Parameter boostDuration is used to enable or disable the CO2 boost for a specific time range between 2 to 10 minutes. When the time has expired the CO2 boost is automatically disabled.

The boostDuration value is set in 1/10s.

[1200; 6000]: Enabled (given duration)

0: Disabled

8.3.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

8.4 GetCO2FlowStatus

The GetCO2FlowStatus command is used for getting the current status of the CO2 flow of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

8.4.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

8.4.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0
Parameter Count	1

Parameter	Data type
CO2FlowStatus	String (Enum)

CO2FlowStatus enum values:

- OK
- NOK

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <Parameter name="CO2FlowStatus">
    <String>OK</String>
  </Parameter>
</ResponseData>
```

8.5 SetCO2NormalFlow

The SetCO2NormalFlow command is used to open or close the CO2 Normal valve of the INHECO SCILA device. CO2 Normal valve is opened by default.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

8.5.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
co2NormalFlow	Boolean			False

8.5.1.1 Parameter: co2NormalFlow

Parameter co2NormalFlow is used to open or close the CO2 Normal valve. The value is stored persistently and after power cycle the INHECO SCILA device will use the last state.

True: CO2 Normal valve opened (normal flow active)
False: CO2 Normal valve closed (normal flow inactive)

8.5.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

9 H₂O

- GetLiquidLevel
- GetValveStatus

9.1 GetLiquidLevel

The GetLiquidLevel command is used for getting the current liquid level of incubation chamber of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

9.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

9.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0
Parameter Count	1

Parameter	Data type
LiquidLevel	String (Enum)

LiquidLevel enum values:

- Empty
- Low
- Normal
- Full
- Overfilled

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <Parameter name="LiquidLevel">
    <String>Empty</String>
  </Parameter>
</ResponseData>
```

10 Valves

- GetValveStatus

10.1 GetValveStatus

The GetValveStatus command is used for getting the current status of the water and carbon dioxide valves of the INHECO SCILA device.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

10.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

10.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	1

Parameter	Data type
H2O	String (Enum)
CO2 Normal	String (Enum)
CO2 Boost	String (Enum)

Valve enum values:

- Opened
- Closed

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd">
  <ParameterSet>
    <Parameter name="H2O">
      <String>Opened</String>
    </Parameter>
    <Parameter name="CO2 Normal">
      <String>Opened</String>
    </Parameter>
    <Parameter name="CO2 Boost">
      <String>Closed</String>
    </Parameter>
  </ParameterSet>
</ResponseData>
```

11 Other

- Delay
- Maintenance

11.1 Delay

The Delay command is used to suspend command execution.

Estimated Duration	1s
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

11.1.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True
duration	Duration	[0ms; 2.147.483.647ms]		False

11.1.1.1 Parameter: duration

Parameter duration defines suspend duration, e.g. a delay of 5 seconds is represented by "PT5S". The maximum duration is Int32.Max milliseconds.

→ https://www.w3schools.com/XML/schema_dtypes_date.asp

11.1.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

11.2 Maintenance

The Maintenance command is used to open all drawers. The drawers open sequentially from the lowest to top. After the command succeeded the INHECO SCILA device will power off.

Estimated Duration	0s (Unknown)
Simulation Mode	Not supported
Pausable	No

The command is not interruptible or stoppable by any SiLA Command. When SiLA command Pause is invoked the SiLA SubState will change to state pauseRequested and remain until processing is finished and then change to state asynchPaused.

11.2.1 Parameters

Name	Data type	[Min; Max]	Default	Nullable
requestId	Int32	[1; 2.147.483.647]		False
lockId	String			True

11.2.2 ResponseData

Response Type	standardResponse
ParameterSet Count	0

No response will be expected, therefore only the XML frame will be send.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResponseData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ResponseType_1.2.xsd"/>
```

12 Appendix

12.1 IHC Web Service Interface

The “IHC Web Service Interface” is available for device monitoring which can be used in parallel to the INHECO SCILA SiLA interface. There are no state machine restrictions, all commands can be invoked in any time after device boot is finished completely.

The web service uses SOAP1.1 over HTTP protocol. The WSDL file is available for download directly from the INHECO SCILA device: <http://<ip-of-device>/ihc.wSDL>.

```
<?xml version="1.0" encoding="utf-8"?>
<definitions name="Inheco" targetNamespace="http://inheco.com" xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:tns="http://inheco.com" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <documentation>SCILA Extended Interface WSDL v0.11 2018-06-26</documentation>
  <types>
    <xsd:schema elementFormDefault="qualified" targetNamespace="http://inheco.com">
      <xsd:element name="DeviceData">
        <xsd:complexType>
          <xsd:sequence>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
        <xsd:element name="DeviceDataResponse">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element minOccurs="1" maxOccurs="1" name="currentTemperature"
nillable="true" type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="targetTemperature"
nillable="true" type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="temperatureControl"
nillable="true" type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="liquidLevel" nillable="true"
type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="drawerState" nillable="true"
type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="valves" nillable="true"
type="xsd:int"/>
              <xsd:element minOccurs="1" maxOccurs="1" name="flowStatus" nillable="true"
type="xsd:int"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:schema>
    </types>
    <message name="Inheco_DeviceData_InputMessage">
      <part name="parameters" element="tns:DeviceData"/>
    </message>
    <message name="Inheco_DeviceData_OutputMessage">
      <part name="parameters" element="tns:DeviceDataResponse"/>
    </message>
    <portType name="InhecoSCILA">
      <operation name="DeviceData">
        <input wsaw:Action="http://inheco.com/DeviceData"
message="tns:Inheco_DeviceData_InputMessage"/>
        <output wsaw:Action="http://inheco.com/DeviceDataResponse"
message="tns:Inheco_DeviceData_OutputMessage"/>
      </operation>
    </portType>
    <binding name="BasicHttpBinding_InhecoScilaService" type="tns:InhecoSCILA">
      <soap:binding transport="http://schemas.xmlsoap.org/soap/http"/>
      <operation name="DeviceData">
        <soap:operation soapAction="http://inheco.com/DeviceData" style="document"/>
        <input>
          <soap:body use="literal"/>
        </input>
        <output>
          <soap:body use="literal"/>
        </output>
      </operation>
    </binding>
  </definitions>
```

12.1.1 DeviceData

The DeviceData command returns information about operating states of the INHECO SCILA device.

12.1.1.1 Parameters

none

12.1.1.2 DeviceDataResponse

Name	Data type	Nullable
currentTemperature	Int32	True
targetTemperature	Int32	True
temperatureControl	Int32	True
liquidLevel	Int32	True
drawerState	Int32	True
valves	Int32	True
flowStatus	Int32	True

12.1.1.3 currentTemperature

The current temperature of incubation chamber in 1/100 [°C].

12.1.1.4 targetTemperature

The target temperature of incubation chamber in 1/100 [°C].

12.1.1.5 temperatureControl

Status of temperature control.

Values:

- 0: Off
- -0: On

12.1.1.6 liquidLevel

Unfiltered raw data of liquid level sensor value, debouncing of value is recommended.

Values:

- 0: Empty
- 1: Low
- 3: Normal
- 7: Full
- 15: Overfilled
- Other: Invalid

12.1.1.7 drawerState

4 x 2bit encoded state of each drawer.

Drawer	4	3	2	1
Bits	$2^7 - 2^6$	$2^5 - 2^4$	$2^3 - 2^2$	$2^1 - 2^0$

Values:

- 0: pulled out
- 1: opened
- 2: closed
- 3: moving

12.1.1.8 Valves

Status and output values of gas and water valves.

Valve	V3		V2		V1	
Valve	Normal Status	Normal Output	Boost Status	Boost Output	H2O Status	H2O Output
Bits	2^5	2^4	2^3	2^2	2^1	2^0

Status value:

- 0: OK
- 1: NOK

Output value:

- 0: Closed
- 1: Opened

12.1.1.9 flowStatus

Status of gas flow.

Values:

- 0: OK
- 1: NOK

12.2 SCILA Finder

For identifying a INHECO SCILA device on network, the SCILA implements a UDP based request response protocol over IPv4. Because the protocol is based on broadcasts the built-in finder is limited to non-routed local networks but doesn't require special network configuration.

12.2.1 Request

There are two different kind of request patterns:

Variant 1 is the recommended method finding SCILAs on network. Only those SCILAs can be found which have suitable subnet configuration to send unicast response.

Variant 2 sends out broadcast for finding all SCILAs on network. A SCILA will send a broadcast response datagram. Any client can find any SCILA in broadcast domain even a unicast connection isn't possible.

12.2.1.1 Variant 1

Client UDP Port: any (≥ 1024)
Server UDP Port: 4711
Request Method: Subnet-Broadcast (recommended) or Broadcast
Response Method: Unicast
Response Port: Client Port

Datagram:

0x53 0x69 0x4c 0x41 0x5f 0x46 0x69 0x6e 0x64 0x65 0x72 0x5f 0x52 0x65 0x71 0x75 0x65 0x73 0x74
--

12.2.1.2 Variant 2

Client UDP Port: any (≥ 1024)
Server UDP Port: 4711
Request Method: Broadcast
Response Method: Broadcast
Response Port: Client Port

Datagram:

0x53 0x69 0x4c 0x41 0x5f 0x46 0x69 0x6e 0x64 0x65 0x72 0x5f 0x52 0x65 0x71 0x75 0x65 0x73 0x74 0x5f 0x42 0x63

12.2.2 Response

When the SCILA device receives a request pattern of variant 1 or 2 it will send a fixed length response datagram which contains information about the device.

Datagram (total length 134 bytes):

Preamble, 16 bytes: 0x01 0x53 0x43 0x49 0x4c 0x41 0x02 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00	
Device Name, 16 bytes, ASCII Null-terminated	
Build Version, 16 bytes, ASCII Null-terminated	
Firmware Version, 32 bytes, ASCII Null-terminated	
Type, 4 bytes UInt32 (little endian)	SOAP Service Port, 2 bytes UInt16 (little endian)
Other (Future Use), 25 bytes	DHCP Enabled, 1 byte (1: true / 0: false)
IPv4 Mask, 4 bytes	Network Gateway Address, 4 bytes
Network DNS1 Address, 4 bytes	Network DNS2 Address, 4 bytes
MAC address, 6 bytes	