

StreamXpress Remote Control API

- ❑ Remote Control of StreamXpress
- ❑ SOAP based
- ❑ C++ Library and WSDL file

Features

- Remote control of *StreamXpress* functions on same PC or from other PC on the network
- Client and *StreamXpress* communicate using industry-standard SOAP messages
- WSDL file enables automatic generation of SOAP proxy
- Remote-Control (RC) license required on DekTec device that runs *StreamXpress*

Copyright © 2024 by DekTec Digital Video B.V.

DekTec Digital Video B.V. reserves the right to change products or specifications without notice. Information furnished in this document is believed to be accurate and reliable, but DekTec Digital Video assumes no responsibility for any errors that may appear in this material.

Table of Contents

Features	1	Struct SpRcSubLoopPars.....	45
Table of Contents	2	Struct SpRcTdtAdaptPars.....	46
SpRcApi – Revision History	3	Struct SpRcTsgPars.....	47
1. Using SpRcApi	5	Struct SpRcTsoipPars.....	49
1.1. Introduction.....	5	SpRcClient::ClearErrors.....	51
1.2. Running StreamXpress.....	5	SpRcClient::GetAsiPars.....	52
1.3. Client-Server Communication.....	5	SpRcClient::GetChannelModellingPars.....	53
1.4. Using SpRcApi.....	5	SpRcClient::GetCmmbPars.....	54
2. Creating a Proxy from WSDL	6	SpRcClient::GetDvbT2Group.....	55
2.1. SpRc.wsdl.....	6	SpRcClient::GetDvbT2Pars.....	56
2.2. Generating the Proxy.....	6	SpRcClient::GetHwNoisePars.....	57
3. Using the Static Link Library	7	SpRcClient::GetIqGain.....	58
3.1. Including and Linking SpRcApi.....	7	SpRcClient::GetIlsdbtPars.....	59
3.2. Checking return codes.....	7	SpRcClient::GetModPars.....	60
3.3. Connecting to StreamXpress.....	7	SpRcClient::GetPayoutInfo.....	61
3.4. Playing a file.....	7	SpRcClient::GetPayoutStatus.....	62
3.5. Synchronous transmission (SFN operation).....	8	SpRcClient::GetRfPars.....	63
SpRcClient – Session Interface	9	SpRcClient::GetSfnStatus.....	64
SpRcClient::CloseSession.....	9	SpRcClient::GetSignalSource.....	65
SpRcClient::CreateSpRcClient.....	10	SpRcClient::GetSpiPars.....	66
SpRcClient::GetRemoteVersion.....	11	SpRcClient::GetTdtAdaptPars.....	67
SpRcClient::GetRemoteDtapiVersion.....	12	SpRcClient::GetTsgPars.....	68
SpRcClient::GetVersion.....	13	SpRcClient::GetTsoipPars.....	69
SpRcClient::OpenSession.....	14	SpRcClient::GetUseNit.....	70
SpRcClient – Application Common Interface	15	SpRcClient::Normalise.....	71
SpRcClient::GetAppInfo.....	15	SpRcClient::OpenChannelModellingFile.....	72
SpRcClient::ShowWindow.....	16	SpRcClient::OpenFile.....	73
SpRcClient – Port Selection Interface	17	SpRcClient::SaveChannelModellingSettings.....	74
Struct PortDesc.....	17	SpRcClient::SaveSettings.....	75
SpRcClient::ScanPorts.....	20	SpRcClient::SetAsiPars.....	76
SpRcClient::SelectPort.....	21	SpRcClient::SetChannelModellingPars.....	77
SpRcClient::SelectDtaPlus.....	22	SpRcClient::SetCmmbPars.....	78
SpRcClient – Payout Interface	23	SpRcClient::SetDvbT2Group.....	79
Struct SpRcAsiPars.....	23	SpRcClient::SetDvbT2Pars.....	80
Struct SpRcCmmbPars.....	25	SpRcClient::SetHwNoisePars.....	81
Struct SpRcCmPars.....	26	SpRcClient::SetIlsdbtPars.....	82
Struct SpRcCmPaths.....	27	SpRcClient::SetIqGain.....	83
Struct SpRcDateTime.....	28	SpRcClient::SetLoopFlags.....	84
Struct SpRcDvbT2Group.....	29	SpRcClient::SetModPars.....	85
Struct SpRcDvbT2Pars.....	30	SpRcClient::SetPayoutState.....	86
Struct SpRcHwNoisePars.....	32	SpRcClient::SetPayoutStateSfn.....	87
Struct SpRclsdbtLayerPars.....	33	SpRcClient::SetRfPars.....	88
Struct SpRclsdbtPars.....	35	SpRcClient::SetSfnMode.....	89
Struct SpRcModPars.....	37	SpRcClient::SetSignalSource.....	90
Struct SpRcPayoutInfo.....	38	SpRcClient::SetSpiPars.....	91
Struct SpRcPayoutStatus.....	40	SpRcClient::SetSubLoopPars.....	92
Struct SpRcSfnStatus.....	41	SpRcClient::SetTdtAdaptPars.....	93
Struct SpRcPayoutSfnPars.....	42	SpRcClient::SetTsgPars.....	94
Struct SpRcRfPars.....	43	SpRcClient::SetTsoipPars.....	95
Struct SpRcSpiPars.....	44	SpRcClient::SetTsRate.....	96
		SpRcClient::SetUseNit.....	97
		SpRcClient::WaitForCondition.....	98

SpRcApi – Revision History

Version	Date	Change Description
v1.12.0.20	2024.11.25	<ul style="list-style-type: none"> Added support for SMPTE RP-198 and RP-219-1 HD colour bar test patterns
v1.11.0.19	2024.05.31	<ul style="list-style-type: none"> Added GetSfnStatus(), SetPayoutStateSfn() and SetSfnMode() to control Single Frequency Network (SFN) payout Added GetTdtAdaptPars()/SetTdtAdaptPars() to set change the time in TDT/TOT Phyton example RC client code available on request Visual Studio 2015 libraries are no longer distributed
v1.10.1.18	2023.03.10	<ul style="list-style-type: none"> Synchronized with StreamXpress v3.31.0.772 and newer for small change in SpRcTsolvPars
v1.10.0.17	2021.12.17	<ul style="list-style-type: none"> Added support for VC17 (Visual Studio 2022) libraries Added support for 64-bit Visual Studio libraries Added SetSubLoopPars function to set relative start and stop for file payout Visual Studio 2010, 2012 and 2013 libraries are no longer distributed
v1.9.0.16	2021.03.16	<ul style="list-style-type: none"> Added support for VC16 (Visual Studio 2019) libraries Added support for ATSC3.0 STLTP (Studio-to-Transmitter Link Transport Protocol) Added support for Digital Radio Mondial (DRM/DRM+) Added support for DVB-T2 version configuration
v1.7.0.14	2019.08.05	<ul style="list-style-type: none"> Added support for VC11, V12, VC14 and VC15 libraries Added support for ISDB-S3
v1.6.0.13	2015.01.08	<ul style="list-style-type: none"> Added GetTsgPars()/SetTsgPars() to control test-generator options
v1.5.0.12	2014.06.25	<ul style="list-style-type: none"> Extend SpRcTsolvPars to support double buffering on DTA-2162 Added GetIqGain()/SetIqGain() functions to allow changing IQ gain when playing out IQ signals Added GetRemoteDtapiVersion() to check the DTAPI version used to build StreamXpress
v1.4.3.10	2014.04.24	<ul style="list-style-type: none"> Added support for DVB-S2X and S2L3
v1.4.2.9	2014.02.13	<ul style="list-style-type: none"> Bugfix release to fix linking problems
v1.4.1.8	2013.03.01	<ul style="list-style-type: none"> Added support for DtaPlus device Added SetRemux() function to control remultiplexing on modulator ports
v1.3.0.6	2012.05.15	<ul style="list-style-type: none"> Added Normalise function Added Open and SaveChannelModellingSettings function Added Set and GetSignalSource functions Added Set and GetUseNit functions Added variables to RfPars struct: SpecInv, CW, RfEnabledOnStop Added SaveSettings function
v1.2.0.5	2011.09.27	<ul style="list-style-type: none"> Added Set and GetCmmbPars functions Added Set and GetDvbT2Group functions Added Set and GetHwNoisePars functions WSDL namespaces, removed "http://localhost:80/SpRc.wsdl" Add SpRcApiNET .NET WSDL proxy wrapper example code Synchronized documentation with SpRc source code
v1.1.0.4	2010.12.08	<ul style="list-style-type: none"> Add Set and GetChannelModellingPars functions Release of WS-I Basic Profile 1.0a compliant WSDL description; used for automatic proxy generation (for example to be used by Tools like Visual Studio.NET and LabView) Add ShowWindow function for hiding/showing StreamXpress Window
v1.0.0.1	2009.02.16	<ul style="list-style-type: none"> First release to the field

1. Using SpRcApi

1.1. Introduction

The StreamXpress Remote-Control API (**SpRcApi**) enables a client application to remotely control the *StreamXpress*, in order to automate the play out of streams. The client can be running on the same PC as the *StreamXpress* or on another PC in the network. Most functions available in the *StreamXpress* GUI are also available through the **SpRcApi**.

In this document, the remotely controlled *StreamXpress* will be interchangeably referred to as "server", "playout server" or "*StreamXpress*".

The client is the application that wishes to remotely control the *StreamXpress*.

1.2. Running StreamXpress

To run the *StreamXpress* as playout server it is required that:

1. The DekTec device used for playout with *StreamXpress* contains a remote control (RC) license;
2. The *StreamXpress* is started with the `-rc` option, followed by the TCP port number that is used to connect, e.g. `-rc 9000`.

1.3. Client-Server Communication

Client and server communicate with each other using SOAP calls over an IP network, or using the local host. SOAP is a standardized protocol that uses messages formatted in XML to execute remote procedure calls.

Currently, SpRcApi supports version 1.1 of the SOAP protocol.

1.4. Using SpRcApi

Basically there are 4 ways to deploy SpRcApi:

- Use the WSDL file in applications that can import WSDL files, e.g. Labview.
- Use the WSDL file to automatically generate client code, commonly called a "proxy". The proxy allows you to call the API methods. Section 2 describes an

example to create a proxy with Visual Studio

- Use the SpRcApiNET example code that includes a .NET "wrapper" for the WSDL generated proxy code.
- For clients written in C++, a library is available that makes the remote-control methods available as C++ methods. This is explained further in Section 3.

The main part of this document describes the classes and API calls in SpRcApi, in C++ syntax. The C++ descriptions are easy to map the equivalent SOAP calls because the WSDL API is structured in a similar way. There is one exception: the SpRcClient constants cannot be used directly, the equivalent integer numbers shall be used.

2. Creating a Proxy from WSDL

2.1. SpRc.wsdl

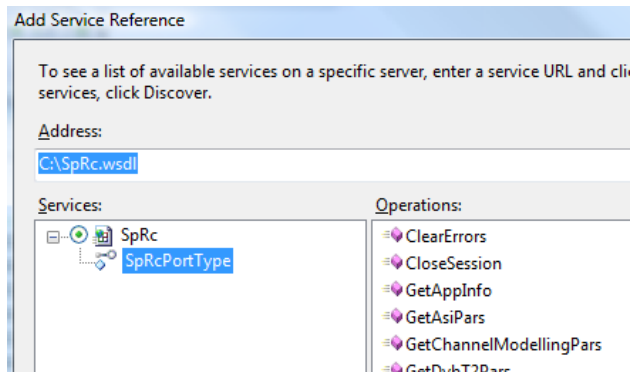
The WSDL is contained in the file SpRc.wsdl, which is available in SpRcApi.zip.

The SpRc.wsdl description is a WS-I Basic Profile 1.0a compliant web-service description. This file can be used in several tools to automatically generate client proxy code. For example, LabView and Visual Studio have the possibility to import the WSDL file.

2.2. Generating the Proxy

The steps below describe how to generate proxy code and how to use this code in a C# program in a Visual Studio environment:

1. After creating a C# project, right mouse click on the 'References' and choose option 'Add Service Reference...'.
 2. In the 'Add Service Reference' dialog select the SpRc.wsdl location, change the Namespace and click on the 'OK' button. This will start the proxy code generation.



Some tools don't accept a file location, for these tools you can use the following address to locate SpRc.wsdl: <http://www.dektec.com/Products/Apps/DT-C-300/SpRc.wsdl>

3. Adapt the generated 'app.config' file to the correct remote IP address and used port number.

```
<client>
  <endpoint
    address = "http://localhost:9000"
    binding = "basicHttpBinding"
    bindingConfiguration = "SpRc"
    contract = "SpRc.SpRcPortType"
    name = "SpRc" />
</client>
```

4. The following C# code shows how to instantiate the generated remote-control client proxy and how to do a few remote-control calls.

The Interface calls and structs are similar to the described SpRcClient API but some differences exist:

- a. The result code can be returned via an out parameter and a parameter can be returned via the return value.
- b. SpRcClient constants cannot be used; the equivalent integer numbers shall be used.

```
// Instantiate .NET generated RC client
SpRc.SpRcPortTypeClient cl =
    new SpRc.SpRcPortTypeClient();

// Open a session
uint res = cl.OpenSession();

// Scan Ports
SpRc.PortDesc[] ports =
    cl.ScanPorts(out res);

// Select DVB-C Modulation
// ( 9 : SPRC_MOD_J83A )
res = cl.SelectPort(ports[0].Serial,
    ports[0].Port, 9, out status);
```

3. Using the Static Link Library

3.1. Including and Linking SpRcApi

Four **SpRcApi** configurations are available for static linking: **SpRcApi.lib**, **SpRcApi.d.lib**, **SpRcApiMD.lib** and **SpRcApiMDd.lib**.

The files with a lowercase 'd' at the end are the debug versions of the DTAPI library.

SpRcApi(d).lib has been compiled with the C/C++ Code-Generation Options in VC++ set to: "Use run-time library: Multithreaded." On the compiler command line this corresponds to the **/MT** option.

SpRcApiMD(d).lib has been compiled with the C/C++ Code-Generation Options in VC++ set to: "Use run-time library: Multithreaded DLL." On the compiler command line this corresponds to the **/MD** option.

The correct version of the **SpRcApi** library file will automatically be linked, because of a **pragma** directive in **SpRcApi.h**.

Automatic linking can be disabled by defining **_SPRCAPI_DISABLE_AUTO_LINK** (using **#define** or in the Pre-processor Definitions).

So, to use static link library of the **SpRcApi** follow these steps:

1. Copy **SpRcApi.h**, **DTAPI.h** and either **SpRcApi(d).lib** or **SpRcApiMD(d).lib** to your project or to a standard location visible to VC++.
2. Add **#include "SpRcApi.h"** to each file using **SpRcApi** functions.
3. Compile your application using the Multithreaded DLL (compiler switch **/MD**) or static (compiler switch **/MT**) version of the C run-time library.

Notes

- The static library files are available for VC14, VC15, VC16 and VC17.
- Using the release version of the static link library with a debug build of your main application may crash your application. This is caused by STL which uses different

lengths of data structures for debug and release builds.

3.2. Checking return codes

While using **SpRcApi**, it's important to check the return value after each call of an **SpRcApi** function. The connection to the StreamXpress playout server may get interrupted at any time, so each method call may fail. The exception to the rule is **GetVersion** which cannot fail.

For code clarity, the examples below do not check the return values of method calls. In production-quality code, however, it's essential to add such checks.

3.3. Connecting to StreamXpress

The following code establishes a connection to the StreamXpress.

```
// Create remote-control client
SpRcClient* SpRc;
SpRc = SpRcClient::CreateSpRcClient();

// Open a session
unsigned char Ip[] = {127,0,0,1};
SpRc->OpenSession(Ip, 9000);
```

Figure 1. Connecting to the StreamXpress.

The first step is to create an **SpRcClient** object, which represents the connection to the playout server.

The next step is to open a session with the playout server, using **OpenSession**. In this case, using local loopback address 127.0.0.1, a connection is established with the **StreamXpress** running on the same PC as the client application. Other PCs on the network can be reached by specifying their IP address.

3.4. Playing a file

The other methods in **SpRcApi** can be used to set parameters and play out a file. To a large extend they speak for themselves.

The code below disables looping, opens a file, starts playout and waits until playout is completed.

```
SpRc->SetLoopFlags(0);
SpRc->OpenFile(L"C:\\Stream.ts");
SpRc->SetPlayoutState(SPRC_STATE_PLAY);
SpRc->WaitForCondition(
    SPRC_COND_STOPPED, -1);
```

The file is opened in the context of the playout server, which means that C: is the C-disk on the playout server, not on the client.

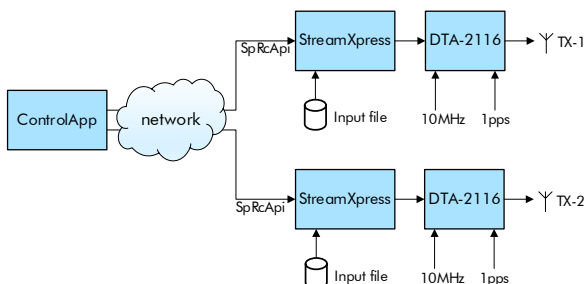
The following code block plays a file for 10 seconds.

```
SpRc->SetPlayoutState(SPRC_STATE_PLAY);
Sleep(10000);
SpRc->SetPlayoutState(SPRC_STATE_STOP);
```

3.5. Synchronous transmission (SFN operation)

The **SpRcApi** can be used for SFN and multi-antenna transmission, e.g. for MIMO tests with multiple transmit antennas.

The output device must be synchronized to a 10MHz and 1pps reference signals.



In the example in the diagram, two instance of the StreamXpress are used, each playing out a file. A "ControlApp" is used to send a start command to the two StreamXpress players, using the **SpRcApi**. The start

command contains the start time, referenced to GPS time.

Using the **SpRcApi**, the ControlApp has also access to GPS time, so that it can send the start time at a well-defined moment, e.g. 500ms in advance. This avoids race conditions.

The other methods in **SpRcApi** can be used to set parameters and the input file.

The code below enables SFN operation, determines a safe start time, and starts playout, after 10 seconds it stops playout and disables SFN operation.

```
// Switch to SFN operation
SpRc1->SetSfnMode(SPRC_SFN_MODE_1PPS);
SpRc2->SetSfnMode(SPRC_SFN_MODE_1PPS);
// Get the current GPS time
SpRc1->GetSfnStatus(Status);
// Start time is 500ms in the future
int StartTime = (Status.m_GpsTime +
    500'000'000)%1'000'000'000;
// Start synchronous playout
SpRc1->SetPlayoutStateSfn(
    {SPRC_STATE_PLAY, StartTime});
SpRc2->SetPlayoutStateSfn(
    {SPRC_STATE_PLAY, StartTime});

Sleep(10000);

// Stop playout
SpRc1->SetPlayoutStateSfn(
    {SPRC_STATE_STOP, 0});
SpRc1->SetPlayoutStateSfn(
    {SPRC_STATE_STOP, 0});
// Disable SFN operation
SpRc1->SetSfnMode(
    SPRC_SFN_MODE_DISABLE);
SpRc2->SetSfnMode(
    SPRC_SFN_MODE_DISABLE);
```


SpRcClient – Session Interface**SpRcClient::CloseSession**

Close the session with the playout server.

```
SPRC_RESULT CloseSession();
```

Parameters**Result**

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The session with the playout server has been closed successfully

Remarks

SpRcClient::CreateSpRcClient

Create client object for issuing remote-control commands to a playout server.

```
static SpRcClient* CreateSpRcClient();
```

Parameters

Result

SPRC_RESULT	Meaning
NULL	Remote-control object cannot be created
pointer	Pointer to StreamXpress remote-control client

Remarks

The SpRcApi is initialised with code similar to the following:

```
SpRcClient* SpRcApi = SpRcClient::CreateSpRcClient();  
SPRC_RESULT Result = SpRcApi->OpenSession(IpAddr, PortNr);
```

After creating the client object and opening the session, all remote control commands are issued through the remote-control object **SpRcApi**.

SpRcClient::GetRemoteVersion

Get **SpRcApi** version number as used in the playout server.

```
virtual void SpRcClient::GetRemoteVersion(  
[out] int& Major           // Major version number  
[out] int& Minor           // Minor version number  
[out] int& BugFix          // Bug fix number  
[out] int& Build           // Build number  
);
```

Parameters

Major, Minor, BugFix, Build

Version number of the **SpRcApi** library which was used in the StreamXpress. For an explanation of **SpRcApi** version numbering, see **SpRcClient::GetVersion**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The remote version number has been read successfully

Remarks

SpRcClient::GetRemoteDtapiVersion

Get **DTAPI** version number used to build StreamXpress.

```
virtual void SpRcClient::GetRemoteDtapiVersion(
    [out] int& Major           // Major version number
    [out] int& Minor          // Minor version number
    [out] int& BugFix         // Bug fix number
    [out] int& Build          // Build number
);
```

Parameters

Major, Minor, BugFix, Build

Version number of the **DTAPI** library which was used in the StreamXpress build.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The remote Dtapi version number has been read successfully

Remarks

SpRcClient::GetVersion

Get version number of the **SpRcApi** client library.

```
virtual void SpRcClient::GetVersion(
    [out] int& Major           // Major version number
    [out] int& Minor          // Minor version number
    [out] int& BugFix         // Bug fix number
    [out] int& Build          // Build number
);
```

Parameters

Major

Major version number. This number is incremented when a non-backward compatible change is introduced in the StreamXpress remote-control API.

Minor

Minor version number. This number is incremented when a method is added to the StreamXpress remote-control API in a backward compatible way. For example, a client with version number 1.3.x.x will be able to interoperate with StreamXpress with API version 1.4.x.x.

BugFix

This number is incremented when a bug in the **SpRcApi** library has been fixed, without functional enhancements.

Build

The build number is a redundant version number that is incremented with every new version of the **SpRcApi** library.

Result

SPRC_RESULT	Meaning
	No return value

Remarks

SpRcClient::OpenSession

Establish a session with the playout server.

```
SPRC_RESULT SpRcClient::OpenSession(  
    [in] unsigned char  IpAddr[4],    // IP address  
    [in] unsigned short PortNr       // Port number  
);
```

Parameters

IpAddr

IP address of the playout server. If the StreamXpress is running on the same machine, 127.0.0.1

PortNr

Port number to access the playout server. The port number should match the port specified in the `-rc port` option when starting the StreamXpress.

Result

SPRC_RESULT	Meaning
SPRC_E_NO_LICK	The port is not properly licensed for playout and remote control
SPRC_OK	The session with the playout server has been opened successfully
SPRC_VERSION_CONFLICT	A session with the playout server has been opened, but a version conflict has been detected between the version of the client SpRcApi and that of the server SpRcApi

Remarks

The **SpRcClient** object supports a single session. If multiple sessions are required, multiple **SpRcClient** objects must be created.

SpRcClient – Application Common Interface

SpRcClient::GetAppInfo

Get information about the application.

```
virtual SPRC_RESULT SpRcClient::GetAppInfo(
    [out] std::wstring& AppName,      // Application name
    [out] Int& MajorVersion,          // Major version number
    [out] Int& MinorVersion,          // Minor version number
    [out] Int& BugFixVersion,         // Bug-fix version number
    [out] Int& BuildNumber);          // Build number
);
```

Parameters

AppName

Application name as Unicode string. For the moment, the only application supporting SpRcApi is StreamXpress.

MajorVersion

Major version number. This number is incremented when the application implements major new functions.

MinorVersion

Minor version number. This number is incremented when the application implements small updates in functionality, possibly together with bug fixes.

BugFixVersion

Bug-fix version number. This number is incremented when the only changes relative to the last version of the application are bug fixes.

BuildNumber

Build number. This number is incremented with new builds of the application. It's never reset to zero so that each version of the application has a different build number.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	Application information is returned successfully

Remarks

SpRcClient::ShowWindow

Show or hide the *StreamXpress* application window.

```
virtual SPRC_RESULT SpRcClient::ShowWindow(
    [in] bool Show           // Show or Hide
);
```

Parameters

Show

Show or hide the *StreamXpress* application window.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The show or hide operation has been executed successfully

Remarks

SpRcClient – Port Selection Interface

Struct PortDesc

Structure describing a physical playout port.

```
struct PortDesc {
    __int64 m_Serial;           // Unique serial number of the device
    int m_TypeNumber;           // Device type number
    int m_Ip[4];                // IP address (for IP ports only)
    int m_Mac [6];              // MAC address (for IP ports only)
    int m_FirmwareVersion;      // Firmware version
    int m_FirmwareVariant;      // Firmware variant
    int m_Port;                 // Physical port number
    int m_OutputType;           // Output type (OR-able flags)
    int m_Capabilities;         // Capability flags (OR-able flags)
    int m_InUse;                // Output port already in use?
};

typedef std::vector<SpRcPortDesc> SpRcPortDescs;
typedef SpRcPortDescs::iterator SpRcPortDescIt;
```

Members

m_Serial

The serial number that uniquely identifies the DekTec device that hosts the playout port.

m_TypeNumber

This integer corresponds to the number in the device's type number, e.g. 245 for the DTU-245.

m_Ip

If the playout port is an IP-network port, this member identifies the IP address. Otherwise, the value of this member is undefined.

m_Mac

If the playout port is an IP-network port, this member identifies the MAC address. Otherwise, the value of this member is undefined.

m_FirmwareVersion

Version number of the firmware loaded on the device that hosts the playout port.

m_FirmwareVariant

Variant of the firmware loaded on the device that hosts the playout port. Some DekTec devices may support multiple variants of the firmware each with different functionality.

m_Port

This integer identifies the physical port number associated with this function. Please refer to DekTec's DTAPI documentation for an overview of physical port numbers per device.

m_OutputType

This field describes the type of stream that can be generated on this playout port. Output types are encoded in flags that may be OR-ed together to indicate that the port supports multiple types.

Value	Meaning
SPRC_OTYPE_ASI	DVB-ASI
SPRC_OTYPE_ATSC	ATSC (VSB) modulation
SPRC_OTYPE_CMMA	CMMA modulation
SPRC_OTYPE_DTMB	DTMB modulation
SPRC_OTYPE_DVBS	DVB-S modulation
SPRC_OTYPE_DVBS2	DVB-S.2 modulation
SPRC_OTYPE_DVBT	DVB-T modulation, includes DVB-H
SPRC_OTYPE_DVBT2	DVB-T2 modulation
SPRC_OTYPE_DVBT2MI	DVB-T2MI
SPRC_OTYPE_IQ	IQ samples
SPRC_OTYPE_ISDBS	ISDB-S modulation
SPRC_OTYPE_ISDBT	ISDB-T modulation
SPRC_OTYPE_QAM_A	QAM modulation, ITU-T J.83 Annex A (DVB-C)
SPRC_OTYPE_QAM_B	QAM modulation, ITU-T J.83 Annex B (US)
SPRC_OTYPE_QAM_C	QAM modulation, ITU-T J.83 Annex C (Japan)
SPRC_OTYPE_SDSI	Standard-definition SDI
SPRC_OTYPE_SPI	DVB-SPI
SPRC_OTYPE_TSOIP	TS-over-IP
SPRC_OTYPE_ISDBS3	ISDB-S3 modulation
SPRC_OTYPE_DRM	DRM modulation
SPRC_OTYPE_ATSC3_STLTP	ATSC 3.0 STLTP modulation

m_Capabilities

This field describes further capabilities of the playout port. Capabilities are encoded in flags that may be OR-ed together to indicate that the port supports multiple capabilities.

Value	Meaning
SPRC_CAP_ADJLVL	Modulator port has an adjustable output level
SPRC_CAP_CM	Modulator port supports channel modelling
SPRC_CAP_DIGIQ	Modulator port has a digital IQ output
SPRC_CAP_IF	Modulator port has an IF output
SPRC_CAP_LBAND	Modulator port can upconvert to L-Band 950 .. 2150MHz
SPRC_CAP_SFN	Modulator port supports Single Frequency Network operation. Supported if the external RF-clock source is selected.
SPRC_CAP_UHF	Modulator port can upconvert to UHF Band 400 .. 862MHz
SPRC_CAP_VHF	Modulator port can upconvert to VHF Band 47 .. 470MHz

m_InUse

This status flag indicates whether the playout port is currently being used.

The “in-use” status is a snapshot of the current situation. Attaching to a playout port that is unused may fail because of race conditions with other applications.

Value	Meaning
SPRC_PORT_CURR	Port is the currently selected playout port in this remote-control session
SPRC_PORT_UNUSED	Port is not used
SPRC_PORT_USED	Port is used by another application

SpRcClient::ScanPorts

Get information about the ports available for play out.

```
virtual SPRC_RESULT SpRcClient::ScanPorts (
    [out] SpRcPortDesc& PortDescs    // List of playout ports
);
```

Parameters

PortDescs

List of playout ports. Refer to **Struct PortDesc** for a description of attributes per port.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	Application information is returned successfully

Remarks

SpRcClient::SelectPort

Select a physical port for play out.

```
virtual SPRC_RESULT SpRcClient::SelectPort(
    [in] __int64 Serial,      // Serial number of device to be selected
    [in] int Port;           // Physical port number to be selected
    [in] int Modulation;     // Initial modulation standard
);
```

Parameters

Serial

The serial number that identifies the DekTec device to be selected.

Port

Physical port number of port to be selected.

Modulation

For modulators only: Initial modulation standard. Use one of the `SPRC_MOD_XXX` constants. Set to 0 otherwise.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_MOD_STANDARD	Initial modulation standard <i>Modulation</i> is not supported on the modulator port
SPRC_E_NO_LICK	The port is not properly licensed for playout and remote control
SPRC_E_NOT_FOUND	Cannot find the playout port identified by <i>Serial</i> and <i>Port</i>
SPRC_E_PORT_USED	The port could not be selected because it's in use by another instance of the StreamXpress or another application
SPRC_OK	The playout port has been selected successfully

Remarks

The playout server will start without file selected and with parameters set to the defaults for the port.

A list of physical ports available for playout can be obtained with `SpRcClient::ScanPorts`.

SpRcClient::SelectDtaPlus

Select a DtaPlus device to use as attenuator.

```
virtual SPRC_RESULT SpRcClient::SelectDtaPlus(  
    [in] bool UseDtaPlus,      // Whether a dta-plus should be used or not  
    [in] __int64 Serial,      // Serial number of DtaPlus to be selected  
);
```

Parameters

UseDtaPlus

Set to true to actually start using a Dta-plus.

Serial

The serial number that identifies the DekTec device to be selected.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NOT_FOUND	Cannot find the Dta-plus port identified by <i>Serial</i>
SPRC_E_PORT_USED	The Dta-plus could not be selected because it's in use by another instance of the StreamXpress or another application
SPRC_OK	The Dta-plus port has been selected successfully

Remarks

SpRcClient – Payout Interface

Struct SpRcAsiPars

Payout parameters for a DVB-ASI output port.

```
struct SpRcAsiPars {
    bool    m_Remux;           // Remultiplex yes/no
    int     m_PlayoutRate;     // Only used if Remux is on
    bool    m_BurstMode;       // DVB-ASI burst mode
    int     m_TxMode;          // Transmit mode
    int     m_Polarity;        // Physical polarity of the ASI signal
};
```

Members

m_Remux

Turn remultiplexing on (true) or off (false). If remultiplexing is on, the StreamXpress adds null packets and adjusts timing information so that the stream is played out at *m_PlayoutRate*. If remultiplexing is off, the stream is played out at the Transport-Stream rate, and *m_Playout* is not used.

m_PlayoutRate

DVB-ASI payout rate.

m_BurstMode

Turn DVB-ASI burst mode on (true) or off (false).

m_TxMode

Transmit mode.

Value	Meaning
DTAPI_TXMODE_188	Transport Packets are assumed to be 188 bytes, and are played out as 188-bytes packets.
DTAPI_TXMODE_204	Transport Packets are assumed to be 204 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_ADD16	Transport Packets are assumed to be 188 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_MIN16	Transport Packets are assumed to be 204 bytes, and are played out as 188-bytes packets.
DTAPI_TXMODE_RAW	No assumptions are made on packet structure. Bytes in the stream are transmitted unmodified. Null-packet stuffing cannot be applied.

m_Polarity

Polarity of the DVB-ASI signal.

Value	Meaning
DTAPI_TXPOL_NORMAL	Generate a 'normal' ASI signal
DTAPI_TXPOL_INVERTED	Generate an inverted ASI signal

Struct SpRcCmmbPars

CMMB parameters.

```
struct SpRcCmmbPars {  
    int m_Bandwidth;           // CMMB Bandwidth  
    int m_AreaId;              // Area ID (0..127)  
    int m_TxId;                // Transmitter ID (128..255)  
};
```

Members

m_Bandwidth

CMMB Bandwidth.

Value	Meaning
DTAPI_CMMB_BW_2MHZ	CMMB 2MHz Bandwidth
DTAPI_CMMB_BW_8MHz	CMMB 8MHz Bandwidth

m_AreaId

Area ID (0..127).

m_TxId

Transmitter ID (128..255).

Struct SpRcCmPars

Channel-modelling parameters.

```
struct SpRcCmPars {  
    bool    m_CmEnable;           // Enable channel modelling  
    bool    m_AwgnEnable;        // Enable noise injection  
    bool    m_PathsEnable;       // Enable transmission path simulation  
    double   m_Snr;              // Signal-to-noise ratio in dB  
    std::vector<SpRcCmPath> m_Paths; // List of transmission paths  
};
```

Members

m_CmEnable

If true, perform channel modelling according to the other values in this struct.
If false, channel modelling is disabled and the other struct values are ignored.

m_AwgnEnable

Enable white noise injection; *m_Snr* specifies the signal to noise ratio.

m_PathsEnable

Enable multipath echo simulation.

m_Snr

The noise power is defined relative to an imaginative 0dB output signal of the modulator. This means that *m_Snr* is the real signal-to-noise ratio only if the accumulated power of the paths in *m_Paths* is 0dB.

m_Paths

List of transmission-path descriptions (maximum 32). See struct **SpRcCmPath**.

Struct SpRcCmPaths

Channel-modelling parameters for a single .

```
struct SpRcCmPath {
    int m_Type; // Type of path fading
    double m_Attenuation; // Attenuation in dB
    double m_Delay; // Delay in us
    double m_Phase; // Phase shift in degrees
    double m_Doppler; // Doppler Frequency in Hz
};
```

Members

m_Type

Type of transmission path values:

Value	Meaning
SPRC_CONSTANT_DELAY	Constant delay and phase
SPRC_CONSTANT_DOPPLER	Constant frequency shift
SPRC_RAYLEIGH_JAKES	Raleigh fading with Jakes power spectral density (mobile path model)
SPRC_RAYLEIGH_GAUSSIAN	Raleigh fading with Gaussian power spectral density (ionspheric path model)

m_Attenuation

Attenuation in dB. The total attenuation of all paths may not exceed 0dB to avoid overflow of the channel simulator.

m_Delay

Delay in us. The maximum delay for an 8MHz channel is 896us.

m_Phase

Phase shift in degrees (value ignored for type **RAYLEIGH_JAKES** and **RAYLEIGH_GAUSSIAN**).

m_Doppler

Doppler frequency in Hz (value ignored for type **CONSTANT_DELAY**). The corresponding Speed in m/s is: $Speed = f_{doppler} * 3.10^8 / f_{RF}$.

Struct SpRcDateTime

Specifies date and time.

```
struct SpRcDateTime {  
    int m_Year;           // Year 1900-2100  
    int m_Month;          // Month 1-12  
    int m_Day;            // Day 1-31  
    int m_Hour;           // Hour 0-23  
    int m_Minute;         // Minute 0-59  
    int m_Second;         // Second 0-59  
};
```

Members

m_Year

The year. The valid values are 1900 – 2100.

m_Month

The month. The valid values are 1 – 12.

m_Day

The day. The valid values are 1 – 31.

m_Hour

The hour. The valid values are 0 – 23.

m_Minute

The minute. The valid values are 0 – 59.

m_Second

The second. The valid values are 0 – 59.

Struct SpRcDvbT2Group

Parameters to specify standard DVB-T2 parameter set groups

```
struct SpRcDvbT2Group {  
    std::wstring m_GroupName;    // Name of the DVB-T2 group  
    std::wstring m_GroupRefName; // Specific set in group  
};
```

Members

m_GroupName

Name of the DVB-T2 group, e.g. "VV1xx".

m_GroupRefName

Specific set in group, e.g. "VV100".

Struct SpRcDvbT2Pars

Structure describing DVB-T2 modulation parameters.

```

struct SpRcDvbT2Pars {
    int m_T2Version; // DVB-T2 version DTAPI_DVBT2_VERSION_x
    int m_Bandwidth; // Channel bandwidth DTAPI_DVBT2_8MHZ/...
    int m_FftMode; // FFT mode (or size) DTAPI_DVBT2_FFT_x
    int m_Miso; // MISO mode DTAPI_DVBT2_MISO_x
    int m_GuardInterval; // Guard interval DTAPI_DVBT2_GI_x
    int m_Papr; // PAPR reduction mode DTAPI_DVBT2_PAPR_x
    int m_BwtExt; // Bandwidth extension 0 or 1
    int m_PilotPattern; // Pilot pattern 1 to 8
    int m_NumT2Frames; // Number of T2 frames in a super frame
    int m_NumDataSyms; // Number of data OFDM symbols per T2 frame
    int m_L1Modulation; // L1 modulation type DTAPI_DVBT2_BPSK/...
    bool m_FefEnable; // Insert FEF (yes/no)
    int m_FefType; // FEF type 0 ... 15
    int m_FefLength; // FEF length
    int m_FefS1; // FEF S1 field value 2 <= FefS1 <= 7
    int m_FefS2; // FEF S2 field value 0 <= FefS2 <= 15
    int m_FefInterval; // FEF interval
    int m_FefSignal; // Type of signal during FEF period
    int m_CellId; // Cell ID
    int m_NetworkId; // Network ID
    int m_T2SystemId; // T2 system ID
    int m_Frequency; // L1-post frequency field value
    // PLP#0 parameters
    bool m_Hem; // High Efficiency Mode (yes/no)
    bool m_Npd; // Null Packet Deletion (yes/no)
    bool m_IssyEnabled; // ISSY enabled (yes/no)
    int m_Id; // PLP ID
    int m_GroupId; // PLP group ID
    int m_Type; // PLP type DTAPI_DVBT2_PLP_TYPE_x
    int m_CodeRate; // Code rate
    int m_Modulation; // Modulation type DTAPI_DVBT2_BPSK/...
    bool m_Rotation; // Constellation rotation (yes/no)
    int m_FecType; // FEC type 0=LDPC 16K, 1=LDPC 64K
    int m_TimeIlLength; // Time interleaving length 0..255
    int m_TimeIlType; // Time interleaving type 0 or 1
    bool m_InBandFlag; // In band signalling information (yes/no)
    bool m_NumBlocks; // Number of FEC blocks per IL frame
    int m_FollowMode; // Mode to compute NumDataSyms/NumBlocks
};

```

Members

m_T2Version, *m_Bandwidth*, *m_FftMode*, *m_Miso*, *m_GuardInterval*, *m_Papr*, *m_BwtExt*, *m_PilotPattern*, *m_NumT2Frames*, *m_NumDataSyms*, *m_L1Modulation*, *m_FefEnable*, *m_FefType*, *m_FefLength*, *m_FefS1*, *m_FefS2*, *m_FefInterval*, *m_FefSignal*, *m_CellId*, *m_NetworkId*, *m_T2SystemId*, *m_Frequency*

Overall DVB-T2 modulation parameters that are not specific per PLP. For a description of these parameters, please refer to the section describing **DtDvbT2Pars** in the DTAPI specification.

m_Hem, m_Npd, m_IssyEnabled, m_Id, m_GroupId, m_Type, m_CodeRate, m_Modulation, m_Rotation, m_FecType, m_TimeI1Length, m_TimeI1Type, m_InBandFlag, m_NumBlocks

Parameters for PLP 0 (the one and only PLP). For a description of these parameters, please refer to the section describing **struct DtDvbT2PlpPars** in the DTAPI specification.

m_FollowMode

This parameter specifies how StreamXpress computes or copies **NUM_DATA_SYMBOLS** (the number of data OFDM symbols per T2 frame) and **PLP_NUM_BLOCKS** (the number of FEC blocks per interleaving frame.)

Value	Meaning
SPRC_T2_FOLLOW_OFF	No automatic computations. NUM_DATA_SYMBOLS is copied from <i>m_NumDataSyms</i> , while PLP_NUM_BLOCKS is copied from <i>m_NumBlocks</i>
SPRC_T2_FOLLOW_OPT1	Compute NUM_DATA_SYMBOLS and PLP_NUM_BLOCKS . Given the DVB-T2 modulation parameters in SpRcDvbT2Pars , the StreamXpress optimises both NUM_DATA_SYMBOLS and PLP_NUM_BLOCKS . The values in <i>m_NumDataSyms</i> and <i>m_NumBlocks</i> are not used.
SPRC_T2_FOLLOW_OPT2	Compute PLP_NUM_BLOCKS . Given the DVB-T2 modulation parameters in SpRcDvbT2Pars including <i>m_NumDataSyms</i> , the StreamXpress optimises PLP_NUM_BLOCKS . The value in <i>m_NumBlocks</i> is not used. NUM_DATA_SYMBOLS is copied from <i>m_NumDataSyms</i> .

Struct SpRcHwNoisePars

Noise parameters for modulators DTA-107 and DTA-2107.

```
struct SpRcHwNoisePars {  
    bool    m_SnrOn;           // Enable Noise generator  
    double   m_Snr;           // Signal Noise ratio  
};
```

Members

m_SnrOn
Enable Noise generator.

m_Snr
Signal-to-noise ratio in dB.

Struct SpRcIsdbtLayerPars

Structure describing ISDB-T modulation parameters for one hierarchical layer. This structure is used in **SpRcIsdbtPars**, in an array of three structs for layer A, B and C.

```
struct SpRcIsdbtLayerPars {  
    int  m_NumSegments;           // Number of segments  
    int  m_Modulation;           // Modulation type  
    int  m_CodeRate;             // Code rate  
    int  m_TimeInterleave;       // Time interleaving  
};
```

Members

m_NumSegments

Number of segments used in this layer. The sum of *m_NumSegment* must be 13.

m_Modulation

Modulation type applied to the segments in this layer.

Value	Meaning
DTAPI_ISDBT_MOD_DQPSK	DQPSK
DTAPI_ISDBT_MOD_QPSK	QPSK
DTAPI_ISDBT_MOD_QAM16	16-QAM
DTAPI_ISDBT_MOD_QAM64	64-QAM

m_CodeRate

Convolutional coding rate applied to the segments in this layer.

Value	Meaning
DTAPI_ISDBT_RATE_1_2	1/2
DTAPI_ISDBT_RATE_2_3	2/3
DTAPI_ISDBT_RATE_3_4	3/4
DTAPI_ISDBT_RATE_5_6	5/6
DTAPI_ISDBT_RATE_7_8	7/8

m_TimeInterleave

Encoded length of time interleaving.

The table below defines the mapping of $m_TimeInterleave$ to parameter l in the time-interleaving process.

Value	Mode 1	Mode 2	Mode 3
0	0	0	0
1	4	2	1
2	8	4	2
3	16	8	4

Struct SpRcIsdbtPars

Modulation parameters for ISDB-T.

```
struct SpRcIsdbtPars {
    bool    m_DoMux;                // Hierarchical multiplexing yes/no
    int     m_BType;                // Broadcast type
    int     m_Mode;                 // Transmission mode
    int     m_Guard;                // Guard interval
    int     m_PartialRx;            // Partial reception
    int     m_Emergency;            // Switch-on control for emergency broadcast
    int     m_IipPid;               // PID used for multiplexing IIP packet
    SpRcIsdbtLayerPars m_LayerPars[3]; // Layer-A/B/C parameters
    std::map<int, int> m_Pid2Layer; // PID-to-layer map
    int     m_LayerOther;           // Other PIDs are mapped to this layer
    int     m_ParXtra0;             // Extra parameters
    int     m_Virtual13Segm;        // Virtual 13-segment mode
};

struct SpRcIsdbtLayerPars {
    int     m_NumSegment;           // Number of segments
    int     m_Modulation;           // Modulation type
    int     m_CodeRate;             // Code rate
    int     m_TimeInterleave;       // Time interleaving
};
```

Members

m_DoMux

If true, perform hierarchical multiplexing in accordance with the ISDB-T parameters as defined explicitly in this structure.

If false, the ISDB-T modulation parameters are specified indirectly by the TMCC information in the 16 extra bytes of the 204-byte packets.

m_BType

Broadcast type.

Value	Meaning
DTAPI_ISDBT_BTYPE_TV	TV broadcast; Can be used with any number of segments
DTAPI_ISDBT_BTYPE_RAD1	1-segment radio broadcast; Total #segments must be 1
DTAPI_ISDBT_BTYPE_RAD3	3-segment radio broadcast; Total #segments must be 3

m_Mode

Transmission mode.

Value	Meaning
1	Mode 1: 2k
2	Mode 2: 4k
3	Mode 3: 8k

m_Guard

Guard-interval length.

Value	Meaning
DTAPI_ISDBT_GUARD_1_32	1/32
DTAPI_ISDBT_GUARD_1_16	1/16
DTAPI_ISDBT_GUARD_1_8	1/8
DTAPI_ISDBT_GUARD_1_4	1/4

m_PartialRx

Flag that indicates whether layer A is used for partial reception: 0 = no partial reception, 1 = partial reception on.

m_Emergency

Flag that indicates whether the switch-on control flag for emergency broadcast should be turned on: 0 = off, 1 = on.

m_IipPid

PID value used for multiplexing the IIP packet.

m_LayerPars

Modulation parameters for hierarchical layers A (element 0), B (1) and C (2).

m_Pid2Layer

Map that specifies the hierarchical layer, or layers, to which an elementary stream is to be mapped. The key in the map is the PID of the elementary stream. The value stored in the map is an OR of one or more flags listed in the table below. A value of 0 indicates that the elementary stream is to be dropped.

Value	Meaning
DTAPI_ISDBT_LAYER_A	Map elementary stream to layer A
DTAPI_ISDBT_LAYER_B	Map elementary stream to layer B
DTAPI_ISDBT_LAYER_C	Map elementary stream to layer C

m_LayerOther

Map streams with PIDs not in *m_Pid2Layer* to this layer.

m_ParXtra0

Extra parameter encoding bandwidth, sample rate and number of segments. This parameter is encoded like ParXtra0 in SetModControl with *ModType* DTAPI_MOD_ISDBT.

m_Virtual13Segm

Use virtual 13 segment mode. The number of segments in layer B is "faked" to be 12.

Struct SpRcModPars

Modulation parameters for all modulation standards except DVB-T2 and ISDB-T.

```
struct SpRcModPars {  
    int m_ModType;           // Modulation type  
    int m_ParXtra0;          // Extra modulation parameter 0  
    int m_ParXtra1;          // Extra modulation parameter 1  
    int m_ParXtra2;          // Extra modulation parameter 2  
    int m_SymRate;           // Symbol rate in bd  
};
```

Members

m_ModType

Modulation type, see `DTAPI_MOD_XXX` constants.

m_ParXtra0, *m_ParXtra1*, *m_ParXtra2*

Modulation parameters, see DTAPI documentation (`SetModControl`).

m_SymRate

Symbol rate in baud. Required for modulation standards that require a symbol rate, like DVB-S. This member should be set to -1 if no symbol rate is required.

Struct SpRcPlayoutInfo

Structure describing static playout information.

```
struct SpRcPlayoutInfo {
    bool    m_BurstMode;           // DVB-ASI burst mode
    bool    m_ExtClock;           // Use external clock
    bool    m_FileCanBeRead;      // A file has been selected that can be read
    std::wstring m_Filename;      // Currently selected filename
    long    m_FileOffsetEnd;      // Number of unused bytes at end of file
    long    m_FileOffsetStart;    // Number of unused bytes at start of file
    long    m_FilePlayedBytes;    // File length minus bytes at start and end
    int     m_FileRateEst;        // TS: Estimated file rate
    long    m_FileSize;           // Size of the file
    int     m_FileType;           // Type of data in file: RAW/TS/SDI
    double  m_LoopBeginRel;       // Subloop, begin position (relative 0..1)
    double  m_LoopEndRel;        // Subloop, end position (relative 0..1)
    int     m_LoopFlags;          // Adapt CC/PCR/TDT and wrap-around flags
    int     m_PlayoutState;       // HOLD/PLAYING
    int     m_PlayoutRate;        // Playout rate @188
    boolean m_Remux;              // Remultiplex mode
    int     m_SymRate;            // Modulators: Symbol rate
    double  m_TimeLoopBegin;      // Time corresponding to beginning of loop
    double  m_TimeLoopEnd;        // Time corresponding to end of loop
    int     m_TimeOffset;         // Offset added to playout time
    int     m_TsRate;             // TS: TS rate @188
    int     m_TpSize;             // TS: packet size
    int     m_TxPolarity;         // Transmit polarity for ASI channels
};
```

Members

m_BurstMode

For ASI channels: DVB-ASI is sent in burst mode yes/no.

m_ExtClock

The transport-stream is taken from the external-clock input.

m_FileCanBeRead

The file that is currently selected is valid.

m_Filename

The name of the file that is currently selected in **StreamXpress**.

m_FileOffsetEnd

Number of unused bytes at the end of the file.

m_FileOffsetStart

Number of unused bytes at start of the file.

m_FilePlayedBytes

The number of bytes from the file that are actually played out (file length minus number of unused bytes at start and end).

m_FileRateEst

TS: Estimated file rate.

m_FileSize

Size of the file.

m_FileType

Type of data in the file: raw data, transport stream or SDI.

m_LoopBeginRel

Start position of the subloop as a relative number between 0 and 1. If a subloop is not used, the value is 0.

m_LoopEndRel

End position of the subloop as a relative number between 0 and 1. If a subloop is not used, the value is 0.

m_LoopFlags

Loop adaptation flags: Adaptation of CC, PCR, TDT and wrap-around flags.

m_PlayoutState

Indicates whether the StreamXpress is paused (hold mode) or playing.

m_PlayoutRate

Rate at which the stream is played. For transport streams, the rate at 188 bytes per packet is used, even if the stream contains 204-byte transport packets.

m_Remux

For transport streams only: Indicates whether the transport-stream is re-multiplexed to another rate.

m_SymRate

For modulators only: Symbol rate.

m_TimeLoopBegin

Playout time corresponding to the beginning of the loop.

m_TimeLoopEnd

Playout time corresponding to the end of loop.

m_TimeOffset

Offset that is added to the playout time.

m_TsRate

Rate of the transport stream in the. For transport streams, the rate at 188 bytes per packet is used, even if the file contains 204-byte transport packets.

m_TpSize

For transport streams only: size of the transport packets.

m_TxPolarity

Transmit polarity for ASI channels.

Struct SpRcPlayoutStatus

Structure describing the dynamic playout status.

```
struct SpRcPlayoutInfo {  
    int    m_FifoLoad;           // Current FIFO load  
    int    m_NumErrors;         // Number of errors (underflows)  
    int    m_NumWraps;          // #wraps  
    double m_PosRel;            // Relative position in subloop (0..1)  
    int    m_TotalMemLoad;       // #bytes in DiskBuffer+MemBuffer (snapshot)  
};
```

Members

m_FifoLoad

Current load of the output FIFO.

m_NumErrors

Number of underflow errors since the last start of playout.

m_NumWraps

Number of times that the file has wrapped since the last start of playout.

m_PosRel

Relative position in the subloop. The client can use *m_PosRel* to synchronise a slider to the slider in the **StreamXpress**.

m_TotalMemLoad

Snapshot of the number of data bytes stored in the disk and memory buffer.

Struct SpRcSfnStatus

Structure describing the dynamic GPS and SFN status.

```
struct SpRcSfnStatus{  
    int    m_GpsStatus;           // Status of 10MHz and 1PPS input signals  
    int    m_GpsTime;            // Current GPS-time  
    int    m_SfnMode;            // Current SFN-mode  
    int    m_SfnStatus;          // Status of the SFN payout  
};
```

Members

m_GpsStatus

Status flags of the 10MHz and 1pps input signals.

Value	Meaning
SPRC_GPS_STATUS_10MHZ_NO_SIGNAL	No (valid) 10MHz clock input signal
SPRC_GPS_STATUS_10MHZ_OUT_RANGE	10MHz input signal frequency out of range
SPRC_GPS_STATUS_10MHZ_SYNC	GPS-time is frequency locked to the 10MHz input signal
SPRC_GPS_STATUS_10MHZ_1PPS_SYNC	GPS-time is locked to the 10MHz and 1pps input signals

m_GpsTime

The current GPS time in nanoseconds; range 0 ... 999.999.999. If there is no 10MHz sync, the GPS time is 0.

m_SfnMode

The current SFN mode:

Value	Meaning
SPRC_SFN_MODE_DISABLE	SFN operation is disabled
SPRC_SFN_MODE_1PPS	SFN uses 1PPS mode. Payout starts relative to the 1pps signal.

m_SfnStatus

The status of the SFN operation

Value	Meaning
SPRC_SFN_STATUS_DISABLED	Not operating in SFN-mode
SPRC_SFN_STATUS_HOLD	SFN payout is ready, and waiting for a play command and accompanying start time
SPRC_SFN_STATUS_STARTING	SFN payout is starting (play command received), payout starts when the start time is reached
SPRC_SFN_STATUS_IN_SYNC	SFN payout is running, and in sync
SPRC_SFN_STATUS_ERROR	SFN payout error has occurred and not in sync, a restart of SFN payout is necessary

Struct SpRcPlayoutSfnPars

Structure for controlling the SFN playout.

```
struct SpRcPlayoutSfnPars{  
    int  m_PlayoutState;           // Playout state  
    int  m_SfnStartTime;          // SFN playout GPS start time  
};
```

Members

m_PlayoutState

New playout state.

Value	Meaning
SPRC_STATE_PLAY	Play
SPRC_STATE_STOP	Stop

m_SfnStartTime

The playout start time in GPS time in nanoseconds; range 0 ... 999.999.999. In case of a stop, the start time is don't care.

Struct SpRcRfPars

Structure describing RF parameters for modulators.

```
struct SpRcRfPars {  
    __int64 m_Frequency;    // RF frequency (Hz)  
    double m_Level;        // RF output level (dBm)  
    bool m_SpecInv;        // RF Spectral inversion  
    bool m_CW;             // RF CW mode  
    bool m_RfEnabledOnStop; // RF output enabled on stop  
};
```

Members

m_Frequency

Center frequency in Hz of the upconverted signal.

m_Level

Level of the main output signal in dBm.

m_SpecInv

Spectral inversion.

m_CW

CW.

m_RfEnabledOnStop

Whether or not the RF output is muted when playback is stopped.

Struct SpRcSpiPars

Playout parameters for a DVB-SPI output port.

```
struct SpRcSpiPars {
    bool    m_Remux;           // Remultiplex yes/no
    int     m_PlayoutRate;     // Only used if Remux is on
    int     m_TxMode;          // Transmit mode
    bool    m_Power;           // Turn power on/off for external adapter
};
```

Members

m_Remux

Turn remultiplexing on (true) or off (false). If remultiplexing is on, the StreamXpress adds null packets and adjusts timing information so that the stream is played out at *m_PlayoutRate*. If remultiplexing is off, the stream is played out at the Transport-Stream rate, and *m_Playout* is not used.

m_PlayoutRate

DVB-SPI playout rate.

m_TxMode

Transmit mode.

Value	Meaning
DTAPI_TXMODE_188	Transport Packets are assumed to be 188 bytes, and are played out as 188-bytes packets.
DTAPI_TXMODE_192	192-byte mode (DTA-102 only) Transport Packets are assumed to be 192 bytes, and are played out as 192-bytes packets.
DTAPI_TXMODE_204	Transport Packets are assumed to be 204 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_ADD16	Transport Packets are assumed to be 188 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_MIN16	Transport Packets are assumed to be 204 bytes, and are played out as 188-bytes packets.
DTAPI_TXMODE_RAW	No assumptions are made on packet structure. Bytes in the stream are transmitted unmodified. Null-packet stuffing cannot be applied.

m_Power

Power for external adapter is switched on or off.

Struct SpRcSubLoopPars

Playout parameters for configuring a file sub loop.

```
struct SpRcSubLoopPars {  
    bool    m_UseSubLoop;           // SubLoop yes/no  
    double  m_LoopBeginRel;         // Relative begin in file  
    double  m_LoopEndRel;           // Relative end in file  
};
```

Members

m_UseSubLoop

Turn SubLoop on (true) or off (false).

m_LoopBeginRel

Relative begin in file, value between 0 and 1.

m_LoopEndRel

Relative end in file, value between 0 and 1.

Struct SpRcTdtAdaptPars

Parameters for specifying the TDT/TOT adaptations.

```
struct SpRcTdtAdaptPars{  
    int m_TdtAdaptMode;           // TOT/TDT adaptation mode  
    SpRcDateTime m_TdtDateTime // Specifies the time to use  
};
```

Members

m_TdtAdaptMode

Type of TDT/TOT adaptation:

Value	Meaning
SPRC_TDT_ADAPT_NOT_1ST_LOOP	Adapt TDT/TOT after first loop
SPRC_TDT_ADAPT_CURRENT_UTC	Use current UTC time
SPRC_TDT_ADAPT_CURRENT_JST	User current JST time
SPRC_TDT_ADAPT_USE_SPECIFIED	Use time specified in <i>m_TdtDateTime</i>

m_TdtDateTime

if *m_TdtAdaptMode* is **SPRC_TDT_ADAPT_USE_SPECIFIED**, the date and time to use in TDT/TOT, otherwise the value is don't care.

Struct SpRcTsgPars

Parameters for the test-signal generator.

```
struct SpRcTsgPars {  
    int m_Type;           // Type of signal generator to use  
    int m_Pid;            // PID to carry the signal for TS modes  
    int m_VidStd;         // Video standard for SDI modes  
    int m_Flags;          // Reserved, set to 0  
};
```

Members

m_Type

Type of signal generator to use:

Value	Meaning
SPRC_TSG_TYPE_PRBS7	PRBS-7 TS generator
SPRC_TSG_TYPE_PRBS15	PRBS-15 TS generator
SPRC_TSG_TYPE_PRBS23	PRBS-23 TS generator
SPRC_TSG_TYPE_PRBS31	PRBS-31 TS generator
SPRC_TSG_TYPE_SDI	SDI generator

m_Pid

PID to carry the PRBS packets. Ignored while in SDI mode.

m_VidStd

Video standard used for SDI signal generator. Ignored while in transport-stream mode.

Value	Meaning
SPRC_VIDSTD_525I59_94	
SPRC_VIDSTD_625I50	
SPRC_VIDSTD_720P23_98	
SPRC_VIDSTD_720P24	
SPRC_VIDSTD_720P25	
SPRC_VIDSTD_720P29_97	
SPRC_VIDSTD_720P30	
SPRC_VIDSTD_720P50	
SPRC_VIDSTD_720P59_94	
SPRC_VIDSTD_720P60	
SPRC_VIDSTD_1080I50	
SPRC_VIDSTD_1080I59_94	
SPRC_VIDSTD_1080I60	
SPRC_VIDSTD_1080P23_98	
SPRC_VIDSTD_1080P24	
SPRC_VIDSTD_1080P25	
SPRC_VIDSTD_1080P29_97	
SPRC_VIDSTD_1080P30	
SPRC_VIDSTD_1080P50	
SPRC_VIDSTD_1080P59_94	
SPRC_VIDSTD_1080P60	

m_Flags

Reserved, set to 0.

Struct SpRcTsoipPars

Parameters for a Transport-Stream-over-IP port.

```
struct SpRcTsoipPars {
    int    m_TxMode;           // Transmission mode (188, 204, Add16, ...)
    unsigned char m_Ip[4];     // IP address
    int    m_Port;            // Port number
    bool   m_EnaFailover;     // Enable IP double-buffering
    unsigned char m_Ip2[4];    // 2nd IP address, used for double-buffering
    int    m_Port2;           // 2nd port number, used for double-buffering
    int    m_TimeToLive;      // TTL
    int    m_NumTpPerIp;      // #TPs per IP packet
    int    m_Protocol;        // Protocol: UDP/RTP
    int    m_DiffServ;        // Differentiated services
    int    m_FecMode;         // Error correction mode
    int    m_FecNumRows;      // 'D' = #rows in FEC matrix
    int    m_FecNumCols;      // 'L' = #columns in FEC matrix
};
```

Members

m_TxMode

Transmit mode.

Value	Meaning
DTAPI_TXMODE_188	Transport Packets are assumed to be 188 bytes, and are played out as 188-bytes packets.
DTAPI_TXMODE_204	Transport Packets are assumed to be 204 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_ADD16	Transport Packets are assumed to be 188 bytes, and are played out as 204-bytes packets.
DTAPI_TXMODE_MIN16	Transport Packets are assumed to be 204 bytes, and are played out as 188-bytes packets.

m_Ip[4]

Destination IP address. If the IP address is in the multicast range, the playout server automatically joins and drops membership of the multicast group.

m_Port

Destination port number.

m_EnaFailover

Enable redundant IP port. Currently only supported on the DTA-2162. The second IP port will playout a duplicate of the signal which can be used by a receiver to conceal errors in either of the two transmission paths.

m_Ip2[4]

m_Port2

See *m_Ip* and *m_Port*. Used if *m_EnaFailover* is true to configure the second IP port.

m_TimeToLive

Time-To-Live (TTL) value to be used for multicast transmission. When *m_Ttl* is 0, a default value is used.

m_NumTpPerIp

Number of Transport Packets (TPs) stored in one IP packet. The range is 1..7.

m_Protocol

Protocol expected for encapsulation of Transport Packets.

Value	Meaning
DTAPI_PROTO_UDP	UDP
DTAPI_PROTO_RTP	RTP

m_DiffServ

Value to be put in the *Differentiated Services* field (formerly *Service Type*) in the IP header.

m_FecMode

Error-correction mode.

Value	Meaning
DTAPI_FEC_DISABLE	No FEC
DTAPI_FEC_2D	RFC2733 parity FEC with 2D extensions as described in Code of Practice #3

m_FecNumRows, *m_FecNumCols*

Number of rows and columns in the FEC matrix. In the *COP #3* these parameters are called *D* and *L* respectively. The following restrictions apply to *L* and *D*:

$$4 \leq D \leq 20, \quad 1 \leq L \leq 20 \quad \text{and} \quad L * D \leq 100$$

SpRcClient::ClearErrors

Clear number-of-errors counter.

```
virtual SPRC_RESULT SpRcClient::ClearErrors(
);
```

Parameters

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The errors have been cleared successfully

Remarks

SpRcClient::GetAsiPars

Get DVB-ASI transmission parameters.

```
virtual SPRC_RESULT SpRcClient::GetAsiPars(
    [out] SpRcAsiPars& AsiPars    // ASI parameters
);
```

Parameters

AsiPars

DVB-ASI transmission parameters, see **Struct SpRcAsiPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_ASI	Invalid operation because the port is not an ASI port or is operating in SDI mode
SPRC_OK	The DVB-ASI transmission parameters have been read successfully

Remarks

SpRcClient::GetChannelModellingPars

Get Channel Modelling parameters.

```
virtual SPRC_RESULT SpRcClient::GetChannelModellingPars (
    [out] SpRcCmPars& CmPars           // Channel Modelling parameters
);
```

Parameters

CmPars

Channel Modelling parameters, see **Struct SpRcCmPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The Channel Modelling parameters have been read successfully

Remarks

SpRcClient::GetCmmbPars

Get CMMB parameters.

```
virtual SPRC_RESULT SpRcClient::GetCmmbPars (
    [out] SpRcCmmbPars& CmmbPars           // CMMB parameters
);
```

Parameters

CmmbPars

CMMB parameters, see **Struct SpRcCmmbPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_CMMB	Invalid operation because the CMMB modulation is not configured
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The parameters have been read successfully

Remarks

SpRcClient::GetDvbT2Group

Get current DVB-T2 group selection.

```
virtual SPRC_RESULT SpRcClient::GetDvbT2Group(
    [out] SpRcDvbT2Group& DvbT2Group // DVB-T2 group
);
```

Parameters

DvbT2Group

DVB-T2 group, see Struct `SpRcDvbT2Group`.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_DVBT2	Invalid operation because the DVB-T2 modulation is not configured
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The parameters have been read successfully

Remarks

SpRcClient::GetDvbT2Pars

Get DVB-T2 parameters.

```
virtual SPRC_RESULT SpRcClient::GetDvbT2Group(
    [out] SpRcDvbT2Pars& DvbT2Pars // DVB-T2 parameters
);
```

Parameters

DvbT2Pars

DVB-T2 parameters, see **Struct SpRcDvbT2Pars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_DVBT2	Invalid operation because the DVB-T2 modulation is not configured
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The parameters have been read successfully

Remarks

SpRcClient::GetHwNoisePars

Get Noise parameters for modulators DTA-107 and DTA-2107.

```
virtual SPRC_RESULT SpRcClient::GetHwNoisePars (
    [out] SpRcHwNoisePars& HwNoisePars // Hw Noise parameters
);
```

Parameters

HwNoisePars

Noise parameters, see Struct **SpRcHwNoisePars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The parameters have been read successfully

Remarks

SpRcClient::GetIqGain

Get IQ gain parameter.

```
virtual SPRC_RESULT SpRcClient::GetIqGain(
    [out] int& IqGain          // IQ gain
);
```

Parameters

IqGain

The gain of the IQ signal in units of 0.1dB

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been read successfully

Remarks

SpRcClient::GetIsdbtPars

Get ISDB-T modulation parameters.

```
virtual SPRC_RESULT SpRcClient::GetIsdbtPars(
    [out] SpRcIsdbtPars& IsdbtPars // ISDB-T parameters
);
```

Parameters

IsdbtPars

ISDB-T modulation parameters, see **Struct** `SpRcIsdbtPars`.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_ISDBT	Invalid operation because the port is operating in ISDB-T modulation mode
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been read successfully

Remarks

SpRcClient::GetModPars

Get modulation parameters.

```
virtual SPRC_RESULT SpRcClient::GetModPars (  
    [out] SpRcModPars& ModPars    // Modulation parameters  
);
```

Parameters

ModPars

Modulation parameters, see **Struct SpRcModPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been read successfully

Remarks

SpRcClient::GetPayoutInfo

Get static payout information.

```
virtual SPRC_RESULT SpRcClient::GetPayoutInfo(
    [out] SpRcPayoutInfo& PoInfo    // Static payout info
);
```

Parameters

PoInfo

Payout information, see Struct **SpRcPayoutInfo**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the payout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The payout information has been read successfully

Remarks

SpRcClient::GetPlayoutStatus

Get dynamic playout status.

```
virtual SPRC_RESULT SpRcClient::GetPlayoutStatus(  
    [out] SpRcPlayoutStatus& PoStatus    // Dynamic playout status  
);
```

Parameters

PoInfo

Playout information, see Struct **SpRcPlayoutInfo**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The playout status has been read successfully

Remarks

SpRcClient::GetRfPars

Get RF parameters.

```
virtual SPRC_RESULT SpRcClient::GetRfPars(
    [out] SpRcRfPars& RfPars           // RF parameters
);
```

Parameters

RfPars

RF parameters, see Struct `SpRcRfPars`.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The RF parameters have been read successfully

Remarks

SpRcClient::GetSfnStatus

Get dynamic GPS and SFN status.

```
virtual SPRC_RESULT SpRcClient::GetSfnStatus (
    [out] SpRcSfnStatus& SfnStatus // GPS and SFN status
);
```

Parameters

SfnStatus

Playout information, see Struct **SpRcSfnStatus**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_SFN	Invalid operation because the port has no SFN capability (or internal RF-clock source is selected)
SPRC_OK	The SFN status has been read successfully

Remarks

SpRcClient::GetSignalSource

Get current signal source (from file / test-generator).

```
virtual SPRC_RESULT SpRcClient::GetSignalSource(
    [out] int& SignalSource // Signal source
);
```

Parameters

SignalSource

Current signal source.

Value	Meaning
SPRC_FROM_FILE	Data is read from file
SPRC_TEST_GENERATOR	The test-signal generator is used to generate an output signal

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The signal source has been read successfully

Remarks

SpRcClient::GetSpiPars

Get DVB-SPI transmission parameters.

```
virtual SPRC_RESULT SpRcClient::GetSpiPars(
    [out] SpRcAsiPars& SpiPars    // DVB-SPI parameters
);
```

Parameters

SpiPars

DVB-SPI transmission parameters, see **Struct SpRcSpiPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_SPI	Invalid operation because the port is not a DVB-SPI port
SPRC_OK	The DVB-SPI transmission parameters have been read successfully

Remarks

SpRcClient::GetTdtAdaptPars

Get TDT/TOT adaptation parameters.

```
virtual SPRC_RESULT SpRcClient::GetTdtAdaptPars(  
    [in] SpRcTdtAdaptPars& TdtAdaptPars// TDT/TOT adaptation parameters  
);
```

Parameters

TdtAdaptPars

TDT/TOT adaptation parameters, see Struct **SpRcTdtAdaptPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The loop-adaptation flags have been set successfully

Remarks

SpRcClient::GetTsgPars

Get test-signal generator parameters.

```
virtual SPRC_RESULT SpRcClient::GetTsgPars(  
    [out] SpRcTsgPars& TsgPars // Test-signal generator parameters  
);
```

Parameters

TsgPars

Test-signal generator parameters, see Struct **SpRcTsgPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_OP_NOT_SUPPORTED	Invalid operation because StreamXpress is not currently running in test-signal generator mode
SPRC_OK	The parameters have been read successfully

Remarks

SpRcClient::GetTsoipPars

Get TSolP transmission parameters.

```
virtual SPRC_RESULT SpRcClient::GetTsoipPars(
    [out] SpRcTsoipPars& TsoipPars // TSoIP parameters
);
```

Parameters

TsoipPars

TSolP transmission parameters, see Struct **SpRcTsoipPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_TSOIP	Invalid operation because the port is not a TSolP port
SPRC_OK	The TSolP transmission parameters have been read successfully

Remarks

SpRcClient::GetUseNit

Checking whether NIT is used for deriving parameters.

```
virtual SPRC_RESULT SpRcClient::GetUseNit(
    [out] bool& UseNit
);
```

Parameters

UseNit

True if and only if StreamXpress will try to use NIT to set the modulation parameters.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The UseNit parameter has been read successfully

Remarks

SpRcClient::Normalise

Normalise the multipath channel modelling.

```
virtual SPRC_RESULT SpRcClient::Normalise();
```

Parameters

Result

SPRC_RESULT	Meaning
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The channel modelling settings have been normalised

Remarks

SpRcClient::OpenChannelModellingFile

Open file with settings for channel modelling.

```
virtual SPRC_RESULT SpRcClient::OpenChannelModellingFile (
    [in] std::wstring& Filename // Filename
);
```

Parameters

Filename

Filename to be opened.

Result

SPRC_RESULT	Meaning
SPRC_E_FILE_CANT_FIND	Can't find a file with the specified filename
SPRC_E_FILE_SYNTAX_ERROR	The specified file contains a syntax error
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The channel modelling settings file has been loaded successfully

Remarks

SpRcClient::OpenFile

Open file for playout.

```
virtual SPRC_RESULT SpRcClient::OpenFile(
    [in] std::wstring& Filename    // Filename
);
```

Parameters

Filename

Filename to be opened.

Result

SPRC_RESULT	Meaning
SPRC_E_FILE_CANT_FIND	Can't find a file with the specified filename
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The playout file has been opened successfully

Remarks

SpRcClient::SaveChannelModellingSettings

Save the channel modelling settings to a file.

```
virtual SPRC_RESULT SpRcClient::SaveChannelModellingSettings (  
    [in] std::wstring&  Filename      // Filename  
);
```

Parameters

Filename

Filename to be opened.

Result

SPRC_RESULT	Meaning
SPRC_E_FILE_CANT_CREATE	Error opening the file for writing
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The channel modelling settings have been saved successfully

Remarks

SpRcClient::SaveSettings

Save the settings to a file.

```
virtual SPRC_RESULT SpRcClient::SaveSettings(  
    [in] std::wstring& Filename    // Filename  
);
```

Parameters

Filename

Filename to be opened.

Result

SPRC_RESULT	Meaning
SPRC_E_FILE_CANT_CREATE	Error opening the file for writing
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_OK	The settings have been saved successfully

Remarks

SpRcClient::SetAsiPars

Set DVB-ASI transmission parameters.

```
virtual SPRC_RESULT SpRcClient::SetAsiPars(
    [in] SpRcAsiPars AsiPars    // ASI parameters
);
```

Parameters

AsiPars

DVB-ASI transmission parameters, see **Struct SpRcAsiPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_ASI	Invalid operation because the port is not an ASI port or is operating in SDI mode
SPRC_E_POLARITY	The polarity specified in <i>AsiPars</i> is not supported by the device
SPRC_E_TXMODE	The transmit mode specified in <i>AsiPars</i> is not compatible with the Transport-Stream file
SPRC_OK	The DVB-ASI transmission parameters have been set successfully

Remarks

SpRcClient::SetChannelModellingPars

Set Channel Modelling parameters.

```
virtual SPRC_RESULT SpRcClient::SetChannelModellingPars(  
    [in] SpRcCmPars CmPars           // Channel Modelling parameters  
);
```

Parameters

CmPars

Channel Modelling parameters, see **Struct SpRcCmPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The Channel Modelling parameters have been set successfully

Remarks

SpRcClient::SetCmmbPars

Set CMMB parameters.

```
virtual SPRC_RESULT SpRcClient::SetCmmbPars (
    [in] SpRcCmmbPars CmmbPars           // CMMB parameters
);
```

Parameters

CmmbPars

CMMB parameters, see **Struct SpRcCmmbPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_E_NOT_CMMB	Invalid operation because CMMB modulation is not configured
SPRC_OK	The parameters have been set successfully

Remarks

SpRcClient::SetDvbT2Group

Set DVB-T2 standard parameter set; e.g. 'V125' parameters.

```
virtual SPRC_RESULT SpRcClient::SetDvbT2Group(  
    [in] SpRcDvbT2Group DvbT2Group    // DVB-T2 parameter set  
);
```

Parameters

DvbT2Group

DVB-T2 standard parameter set, see **Struct** `SpRcDvbT2Group`.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_E_NOT_DVB-T2	Invalid operation because DVB-T2 modulation is not configured
SPRC_OK	The parameters have been set successfully

Remarks

SpRcClient::SetDvbT2Pars

Set DVB-T2 parameters.

```
virtual SPRC_RESULT SpRcClient::SetDvbT2Pars (
    [in] SpRcDvbT2Pars DvbT2Pars // DVB-T2 parameters
);
```

Parameters

DvbT2Pars

DVB-T2 parameters, see **Struct SpRcDvbT2Pars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_E_NOT_DVB-T2	Invalid operation because DVB-T2 modulation is not configured
SPRC_OK	The parameters have been set successfully

Remarks

SpRcClient::SetHwNoisePars

Set Noise parameters for modulators DTA-107 and DTA-2107.

```
virtual SPRC_RESULT SpRcClient::SetHwNoisePars (
    [in] SpRcHwNoisePars HwNoisePars    // Noise parameters
);
```

Parameters

HwNoisePars

Noise parameters, see Struct **SpRcHwNoisePars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The parameters have been set successfully

Remarks

SpRcClient::SetIsdbtPars

Set ISDB-T modulation parameters.

```
virtual SPRC_RESULT SpRcClient::SetIsdbtPars (
    [in] SpRcIsdbtPars IsdbtPars    // ISDB-T parameters
);
```

Parameters

IsdbtPars

ISDB-T modulation parameters, see **Struct SpRcIsdbtPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_ISDBT	Invalid operation because the port is operating in ISDB-T modulation mode
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been set successfully

Remarks

SpRcClient::SetIqGain

Set IQ gain parameter.

```
virtual SPRC_RESULT SpRcClient::SetIqGain(
    [in] int IqGain          // IQ gain
);
```

Parameters

IqGain

The gain of the IQ singal.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been set successfully

Remarks

SpRcClient::SetLoopFlags

Set loop-adaptation flags.

```
virtual SPRC_RESULT SpRcClient::SetLoopFlags(
    [in] int  LoopFlags          // Loop-adaptation flags
);
```

Parameters

LoopFlags

Loop-adaptation flags encoded in flags that may be OR-ed together.

Value	Meaning
SPRC_LOOP_CC	Adapt continuity counters
SPRC_LOOP_PCR	Adapt PCR
SPRC_LOOP_TDT	Adapt TDT
SPRC_LOOP_WRAP	Auto wrap-around

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The loop-adaptation flags have been set successfully

Remarks

SpRcClient::SetModPars

Set modulation parameters for all modulation standards except ISDB-T and DVB-T2.

```
virtual SPRC_RESULT SpRcClient::SetModPars(
    [in] SpRcModPars ModPars    // Modulation parameters
);
```

Parameters

ModPars

Modulation parameters, see **Struct SpRcModPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The modulation parameters have been set successfully

Remarks

SpRcClient::SetPlayoutState

Set playout state (play/pause/stop).

```
virtual SPRC_RESULT SpRcClient::SetPlayoutState(  
    [in] int    PlayoutState        // Playout state  
);
```

Parameters

PlayoutState

New playout state.

Value	Meaning
SPRC_STATE_PAUSE	Pause
SPRC_STATE_PLAY	Play
SPRC_STATE_STOP	Stop

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_INV_IN_SFN	Not allowed when SFN mode is active
SPRC_E_INV_STATE	Invalid playout state
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The playout state has been set successfully

Remarks

SpRcClient::SetPlayoutStateSfn

Set playout state for SFN (play/stop).

```
virtual SPRC_RESULT SpRcClient::SetPlayoutStateSfn(
    [in] SpRcPlayoutSfnPars PlayoutPars // SFN playout parameters
);
```

Parameters

PlayoutPars

SFN playout parameters, see Struct **SpRcPlayoutSfnPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_INV_STATE	Invalid playout state
SPRC_E_INV_PARS	Invalid start time
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_SFN	Not allowed when SFN mode is disabled
SPRC_OK	The modulation parameters have been set successfully

Remarks

SpRcClient::SetRfPars

Set RF parameters.

```
virtual SPRC_RESULT SpRcClient::SetRfPars(
    [in] SpRcRfPars  RfPars           // RF parameters
);
```

Parameters

RfPars

RF parameters, see Struct **SpRcPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_INV_FREQ	The centre frequency in <i>RfPars</i> is not supported by the upconverter on this modulator
SPRC_E_INV_LEVEL	The level in <i>RfPars</i> is not supported by this modulator
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_MOD	Invalid operation because the port is not a modulation port
SPRC_OK	The RF parameters have been set successfully

Remarks

SpRcClient::SetSfnMode

Change the SFN mode.

```
virtual SPRC_RESULT SpRcClient::SetSfnMode (
    [in] int SfnMode // SFN mode
);
```

Parameters

SfnMode

New SFN mode.

Value	Meaning
SPRC_SFN_MODE_DISABLE	SFN disabled
SPRC_SFN_MODE_1PPS	SFN 1PPS mode. Playout starts relative to the 1pps signal

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_INV_STATE	Invalid operation when StreamXpress is playing
SPRC_E_NOT_SFN	Invalid operation because the port has no SFN capability
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The signal source has been changed successfully

Remarks

SpRcClient::SetSignalSource

Change signal source (from file / test-generator).

```
virtual SPRC_RESULT SpRcClient::SetSignalSource(
    [in] int  SignalSource          // Signal source
);
```

Parameters

SignalSource

New signal source.

Value	Meaning
SPRC_FROM_FILE	Data is read from file
SPRC_TEST_GENERATOR	The test-signal generator is used to generate an output signal

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_OP_NOT_SUPPORTED	Current modulation type is not supported
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The signal source has been changed successfully

Remarks

SpRcClient::SetSpiPars

Set DVB-SPI transmission parameters.

```
virtual SPRC_RESULT SpRcClient::SetSpiPars(
    [in] SpRcSpiPars SpiPars        // DVB-SPI parameters
);
```

Parameters

SpiPars

DVB-SPI transmission parameters, see **Struct SpRcSpiPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_SPI	Invalid operation because the port is not a DVB-SPI port
SPRC_E_TXMODE	The transmit mode specified in <i>SpiPars</i> is not compatible with the Transport-Stream file
SPRC_OK	The DVB-SPI transmission parameters have been set successfully

Remarks

SpRcClient::SetSubLoopPars

Configuring a file sub loop.

```
virtual SPRC_RESULT SpRcClient::SetSubLoopPars (
    [in] SpRcSubLoopPars SubLoopPars    // SubLoop parameters
);
```

Parameters

SubLoopPars

SubLoop parameters, see **Struct SpRcSubLoopPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_INV_PARS	SubLoop parameters invalid; make sure that the values are between 0 and 1
SPRC_OK	The SubLoop parameters have been set successfully

Remarks

SpRcClient::SetTdtAdaptPars

Set TDT/TOT adaptation parameters.

```
virtual SPRC_RESULT SpRcClient::SetTdtAdaptPars(
    [in] SpRcTdtAdaptPars TdtAdaptPars // TDT/TOT adaptation parameters
);
```

Parameters

TdtAdaptPars

TDT/TOT adaptation parameters, see Struct **SpRcTdtAdaptPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The loop-adaptation flags have been set successfully

Remarks

Setting the TOT/TOT adaptation parameters has only effect if the TDT loop flag is set, see **SpRcClient::SetLoopFlags**.

SpRcClient::SetTsgPars

Set test-signal generation parameters.

```
virtual SPRC_RESULT SpRcClient::SetTsgPars(
    [in] SpRcTsgPars TsgPars // test-signal generation parameters
);
```

Parameters

TsgPars

Test-signal generation parameters, see Struct **SpRcTsgPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_OP_NOT_SUPPORTED	Invalid operation because StreamXpress is not currently running in test-signal generator mode
SPRC_OK	The parameters have been set successfully

Remarks

SpRcClient::SetTsoipPars

Set TSolP transmission parameters.

```
virtual SPRC_RESULT SpRcClient::SetTsoipPars(
    [in] SpRcTsoipPars TsoipPars    // TSoIP parameters
);
```

Parameters

TsoipPars

TSolP transmission parameters, see Struct **SpRcTsoipPars**.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_E_NOT_TSOIP	Invalid operation because the port is not a TSolP port
SPRC_OK	The TSolP transmission parameters have been set successfully

Remarks

SpRcClient::SetTsRate

Set Transport-Stream rate

```
virtual SPRC_RESULT SpRcClient::SetTsRate(  
    [in] Int    TsRate           // Transport-Stream rate  
);
```

Parameters

TsRate

Transport-Stream rate in bits per second; 188 bytes per Transport Packets

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The rate has been set successfully

Remarks

SpRcClient::SetUseNit

Enable or disable the use of NIT for deriving modulation parameters

```
virtual SPRC_RESULT SpRcClient::SetUseNit(  
    [in] Bool UseNit  
);
```

Parameters

UseNit

Whether or not NIT should be used.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_NO_PORT	Invalid operation because no port is selected
SPRC_OK	The parameter has been set successfully

Remarks

SpRcClient::WaitForCondition

Wait for a certain condition.

```
virtual SPRC_RESULT SpRcClient::WaitForCondition(  
    [in] int Condition,          // Playout state to wait for  
    [in] int TimeOut            // Maximum time to wait in ms  
);
```

Parameters

Condition

Condition to wait for.

Value	Meaning
SPRC_COND_STOPPED	Playout server is in a stopped state; In this context, pause is not considered a stopped state

TimeOut

Time-out period in ms. If this parameter is -1 no time out is applied.

Result

SPRC_RESULT	Meaning
SPRC_E_COMMUNICATION	An error has occurred in the communication with the playout server
SPRC_E_INV_CONDITION	An invalid condition has been specified
SPRC_OK	The condition has occurred
SPRC_TIME_OUT	The time out has triggered

Remarks