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PROS Event Client SDK

Version 1.3

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About

PROS Event Client SDK is a tool for connecting your software to PROS CS Server. This connection will provide informations about Access control system configuration, users, events, inputs and outputs states and enable remote control of doors and outputs.

SDK is build with Microsoft Visual Studio 2015 using VB.NET and .NET 4.0.

With the SDK is provided VB.NET and C# sample project PROS_Event_Client_demo that will demonstrate full functionality of the SDK.

PROS Event Client SDK is compatible with PROS CS setup version 1.3.0 and above (PROS Server version 4.2.0.0 and above). Recommended version is 4.3.2 and above.

Controllers recommended firmware version for full functionality is 3.3 or higher.

Portals recommended firmware version for full functionality is 2.2 or higher.

PROS CS setup can be downloaded at: <https://www.sendspace.com/folder/t9temh>.

Support email: techsupport@xprgroup.com

SDK Changes

Version 1.1

- Added Output commands OutputON and OutputOFF
- Added Hardware event Output_OFF_By_PC

Version 1.2

- Upgraded for compatibility with PROS CS version 4.7.0 and higher

Version 1.3

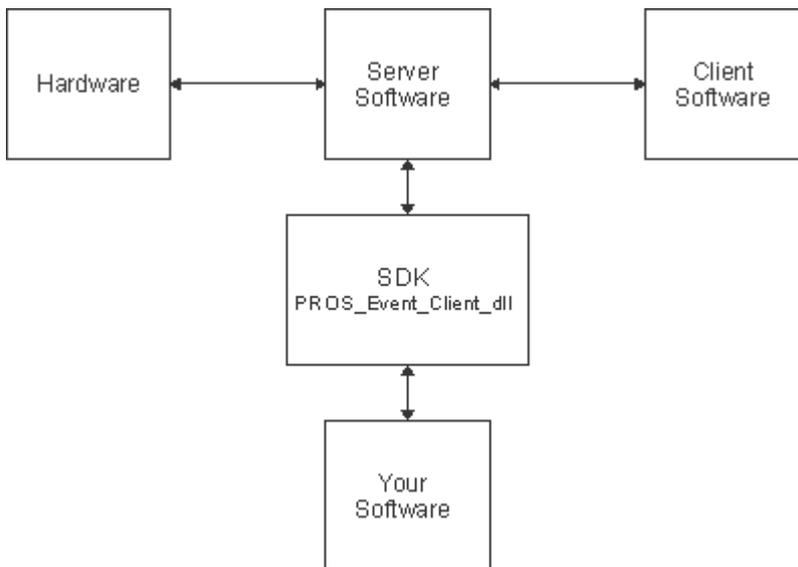
- Upgraded for compatibility with PROS CS version 5.0.0 and higher

System overview

Access control system is made of the following components:

- Hardware. Hardware component is system of devices installed at secured site. Main components of the hardware system are Controllers, Readers, Door locks.
- PROS Server. Software that is running as a service in the PC with Windows OS. Only one server can exist in the system.
- PROS Client. Software to provide interface between system administrator/user and Server. One system can have more Clients.

Integration between Access control system and your software can be done using PROS_Event_Client_dll.



PROS_Event_Client_dll will enable your software to follow the events in the system, status of the items like communication, doors, inputs, outputs, system configuration and give the possibility to send commands to door locks and outputs.

Configuring the Access control system

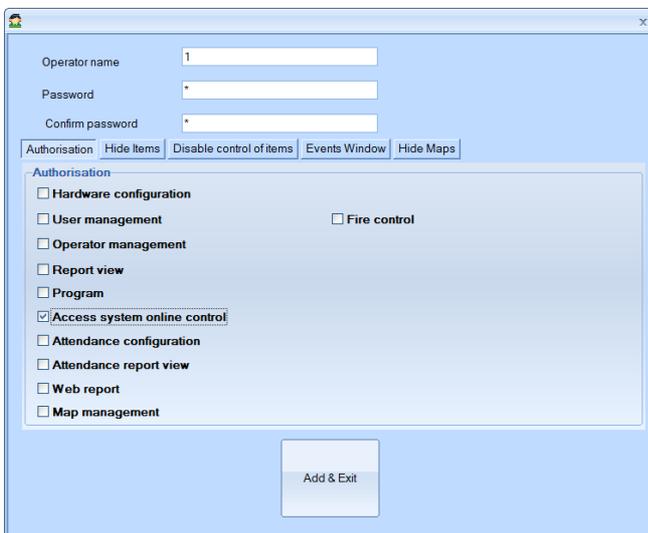
Before testing the demo software or start development, you need to have installed and running Access control system.

In the Access Control System has to be added new Operator with credentials that will be used by SDK:

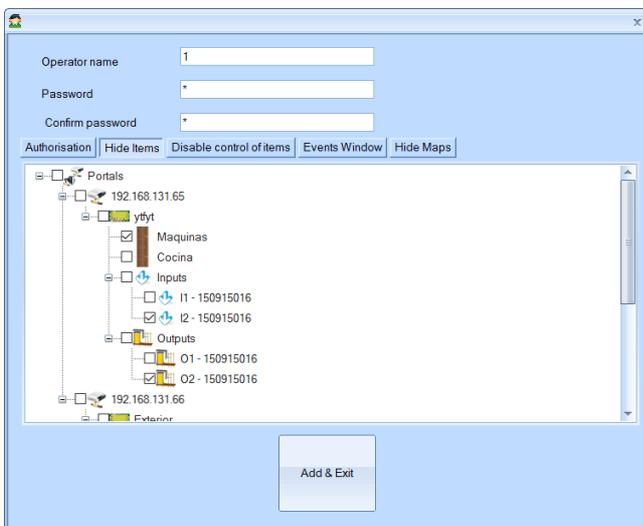
1. Have complete access system installed and fully functional.
2. Run PROS Client with administrator credentials and connect to PROS Server.
3. Right-click on the Operators item in the bottom right tree view panel and select "Add operator".



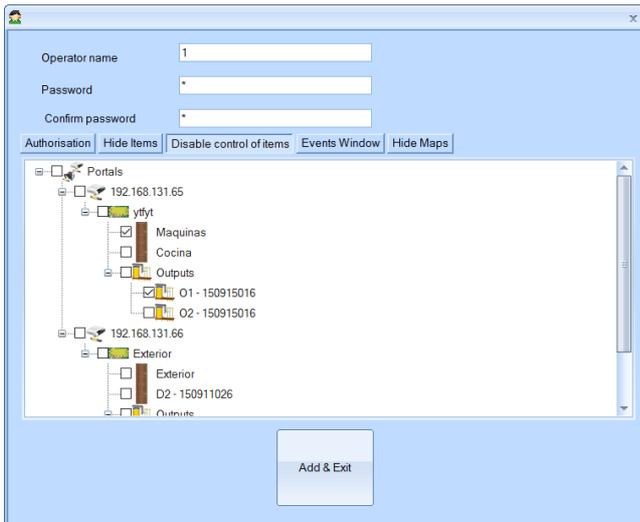
4. At the Operator Window enter the Operator Name and Password. If you want to send commands for doors and outputs, check option "Access system online control". In the demo software default User Name is "1" and Password is "1" so for the start you can use this values.



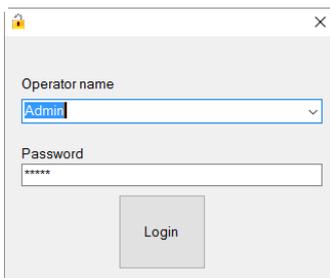
5. In the "Hide items" tab select items you do not want to follow with your software.



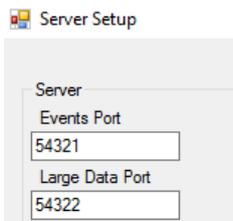
6. In the "Disable control of items" tab select items you do not want to control with your software.



7. Connection IP port of the server by default is 54321. If this is changed, at the PROS Server PC run PROS CS Setup from desktop icon and enter Administrator login credentials (default Name: Admin , Password: admin).



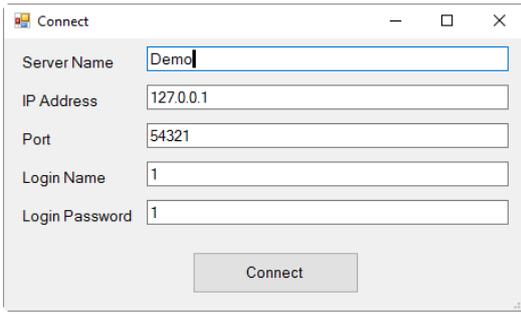
8. Value in the "Event port" text box is the port you need to connect with the server. Write it down and close the window.



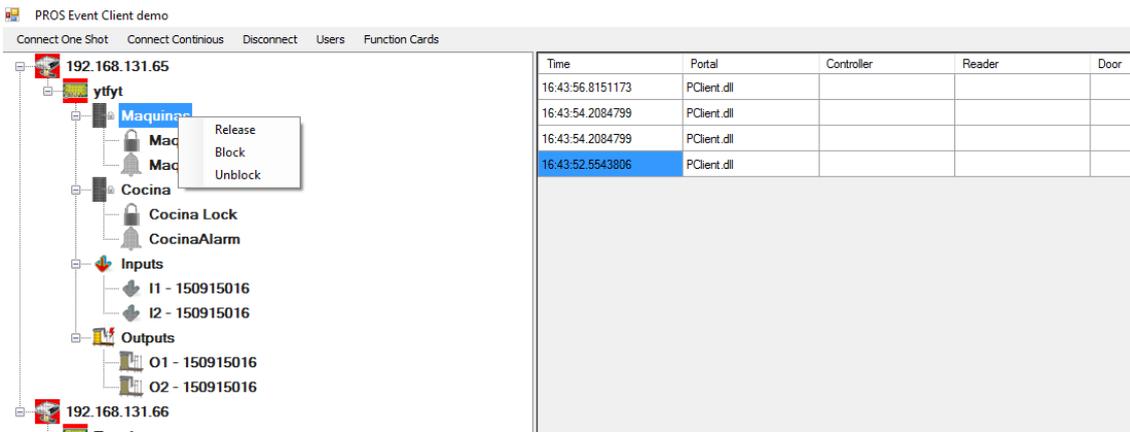
9. From the SDK samples, run PROS_Event_Client_demo.exe and click on menu "Connect One Shot".



10. Enter the values in fields. For server name you can choose any name. IP address is the IP address of the PC where PROS Server is installed. Port is the "Event Port" from point 9.



11. If Demo client is connected to PROS Server, system hardware will be displayed at the left tree view. To complete the test, right click on door or output item and select one command to be performed.



Modules

PROS Client SDK 1.0 consist of PROS_Event_Client_DLL and sample application project to describe how to use this module.

The main usage of each module is described as follows:

Module name	Usage
PROS_Event_Client_DLL	To connect to PROS Server and exchange data and commands with your application

Module PROS_Event_Client_DLL

Module classes are described in the table:

Class	Description
ConfigurationChangedArgs	Provide arguments for configuration change event
ConnectionStateArgs	Provide arguments for connector to PROS Server state change event
DeviceStatusArgs	Provide argument for device state change event
HardwareEventArgs	Provide arguments for arrived events from Access control hardware
PROSEventClient	Main class for connection to PROS Server
Module	Description
Constants	Enumerated values for use in the software

Module Constants

Module Constants contains enumeration values for handling messages and events as follows:

byte CommandForItem		
Member	Value	Refer to
Portal	1	Portal of the Access control system
Controller	2	Access controller in the Access control system
Door	3	Door in the Access control system
Reader	4	Reader in the Access control system
Input	5	Input in the Access control system
Output	6	Output in the Access control system
Sistem	221	PROS Server

byte ClientRequest		
Member	Value	Refer to
HardwareCommunication_START	85	PROS Server started communication with the Access control system
HardwareCommunication_STOP	86	PROS Server has stopped the communication with the Access control system
DoorReleaseLock	12	Command to release door
DoorLock	13	Command to block the door
DoorUnlock	14	Command to unblock the door.
OutputActivate	15	Command to activate output relay. If relay is in timed mode, relay will turn ON and will be automatically turned OFF by the time it is set. If relay is in toggle mode, it will change state (ON to OFF or OFF to ON)
OutputEnable	16	Command to enable output relay
OutputDisable	17	Command to disable output relay
OutputON	102	Command to set output relay in ON state. If relay is in timed mode, relay will turn ON and will be automatically turned OFF by the time it is set. If relay is in toggle mode, it will change state to ON. This command is supported in PROS Server version 4.3.1 or higher and Controller firmware version 3.3 or higher.
OutputOFF	103	Command to set output relay in OFF state. If relay is in timed mode, relay will turn OFF. If relay is in toggle mode, it will change state to OFF. This command is supported in PROS Server version 4.3.1 or higher and Controller firmware version 3.3 or higher.

byte ServerResponse		
Member	Value	Refer to
Added	1	PROS Server informs that item was added
Edited	2	PROS Server informs that item was edited
Deleted	3	PROS Server informs that item was deleted

byte ServerResponse

Controller_Online	30	PROS Server informs that communication is lost with access controller
Controller_Offline	31	PROS Server informs that communication is restored with access controller
Portal_Online	32	PROS Server informs that communication is lost with access communication portal
Portal_Offline	33	PROS Server informs that communication is restored with access communication portal

byte HardwareEvents

Member	Value	Refer to
Time_changed_by_PC	1	Controller clock
Time_changed_by_DST	2	Controller clock
APB_reset_by_Function_Card	3	Anti pass back
Alarm_reset_by_Function_Card	4	Alarm
User_location_reseted_by_Card	5	Anti pass back
Enter_Event	20	User access
Exit_Event	21	User access
Activated_output	30	Output
Shift_Start	40	User access
Shift_End	41	User access
Break_Start	42	User access
Break_End	43	User access
Official_leave	45	User access
Private_leave	46	User access
Official_return	47	User access
Private_return	48	User access
Free_access	49	User access
Access_granted	50	User access
Access_denied_no_authorisation	51	User access
Access_denied_Wrong_user_TZ	52	User access
Access_denied_APB	53	User access
Access_denied_Mantrap	54	User access
Access_denied_Wrong_password	55	User access
Access_denied_Card_expired	56	User access
Access_denied_ID_unknown	57	User access
Access_denied_User_Suspended	58	User access
Access_denied_wrong_door_TZ	59	User access

byte HardwareEvents		
Access_denied_Extended_Mantrap	60	User access
Access_denied_Door_is_locked	61	User access
Access_denied_Bad_Access_Code	62	User access
Access_denied_Door_Disabled	63	User access
Access_denied_by_GAPB	64	User access
Door_open	128	Door
Door_forced	129	Door
Door_left_open_alarm_1	130	Door
Door_open_too_long_alarm_2	131	Door
PB_on	132	Door
Door_Closed	133	Door
Input_ON	134	Input
Input_OFF	135	Input
Door_opened_by_PC	136	Door
Door_Locked_by_PC	137	Door
Door_Unlocked_by_PC	138	Door
Output_ON	139	Output
Output_OFF	140	Output
OUTPUT_ON_by_PC	141	Output
Disabled_OUTPUT_by_PC	142	Output
Enabled_OUTPUT_by_PC	143	Output
APB_reset_by_PowerUp	144	Anti pass back
APB_reset_by_Timeout	145	Anti pass back
APB_reset_by_PC	146	Anti pass back
APB_reset_by_FreelInput	148	Anti pass back
Output_OFF_By_PC	149	Output (Available from PROS Server version 4.3.1 and Controller firmware version 3.3)
Door_Locked	150	Door
Door_Unlocked	151	Door
Door_Unlocked_By_Timezone	152	Door
Door_Ublock_By_Timezone	153	Door
Door_Block_By_Timezone	154	Door
Communication_timeout	155	Communication
Communication_restored	156	Communication
GAPB_enabled	157	Global Anti pass back

byte HardwareEvents		
GAPB_disabled	158	Global Anti pass back
Fire_ON_Request_Denied	175	Global Fire Alarm
Fire_ON_Request_By_System	176	Global Fire Alarm
Fire_OFF_Request_By_System	177	Global Fire Alarm
Fire_ON_Request_By_Operator	178	Global Fire Alarm
Fire_OFF_Request_By_Operator	179	Global Fire Alarm
Fire_input_ON	180	Fire Alarm
Fire_input_OFF	181	Fire Alarm
Max_illegal_attempts_reader_disabled	182	Reader
Reader_unblocked	183	Reader
Unit_closed_tamper	184	Controller
Unit_opened_tamper	185	Controller
Firmware_Upgrade_Success	190	Controller
Firmware_Upgrade_Canceled	191	Controller
Firmware_Upgrade_Timeout	192	Controller
Firmware_Upgrade_Failed	193	Controller
SRAM_error	200	Controller
Reader_error	201	Controller
No_timezones_assigned_to_controller	202	Controller
RTC_Error	203	Controller
SRAM_formated	204	Controller
UrgentWarning	205	Controller
Power_Loss	209	Controller
System_ON	210	Controller
EEPROM_Error	236	Controller
ID_exist	237	Controller
Access_Code_exist	238	Controller
Bad_event_date	244	Controller
Bad_firmware_CRC	245	Controller
Bad_firmware_header	246	Controller
Events_memory_full	247	Controller
User_memory_full	248	Controller
Cannot_be_performed	249	Controller
Unknown_command	250	Controller
No_events_in_memory	251	Controller

byte HardwareEvents

User_ID_not_found	252	Controller
Wrong_values	253	Controller

byte DoorStatus

Member	Value	Refer to
Unknown	0	Door state is unknown
Open	1	Door is open
Closed	2	Door is closed

byte LockStatus

Member	Value	Refer to
Unknown	0	Lock state is unknown
Locked	1	Lock is locked
Unlocked	2	Lock is released
Blocked	3	Lock is blocked

byte DoorAlarm

Member	Value	Refer to
Normal	0	No alarms active
ForcedOpen	1	Door is open by force
LeftOpen_Alarm1	2	Door is left open
OpenTooLong_Alarm2	3	Door is left open too long

byte InputState

Member	Value	Refer to
Unknown	0	Input state is unknown
InputON	1	Input is activated
InputOFF	2	Input is not activated
FireON	3	Fire alarm is active
FireOFF	4	Fire alarm is not active

byte OutputState

Member	Value	Refer to
Unknown	0	Output state is unknown
OutputON	1	Output is activated
OutputOFF	2	Output is not activated
Disabled	3	Output is disabled

byte HardwareCommandsResponse

Member	Value	Refer to
OK	0	Command is sent to PROS Server

byte HardwareCommandsResponse

NoPermission	1	Insufficient credentials of the operator
ItemDoesNotExists	2	Item is not found in the system
FailToSend	3	Could not send command to PROS Server
ErrorRised	4	Exception rised in procedure
UnknownDeviceType	5	Device type is unknown

byte ConnectionStatus

Member	Value	Refer to
Connected	0	Connected to PROS Server
Disconnected	1	Disconnected from PROS Server
Connecting	2	Connection procedure started
CanNotConnectEventChannel	3	Can not connect to Event channel
EventChannelConnected	4	Event Channel connected
InvalidOperatorNamePassword	5	Invalid login credentials
AlreadyConnectedToServer	6	Connection stoped as it is already connected
VersionMismatch	7	Different PROS Server version
InvalidRockey_HID	8	Invalid USB Dongle
ServerRestarting	9	PROS Server is restarting
LoginRefusedUnknownReason	10	Login rejected
LoginToServerTimeout	11	Timeout in login procedure
LoginFailedBadServerResponse	12	Bad response from server
LoginExceptionRised	13	Exception rised in login procedure
LoginSuccess	14	Logged to PROS Server
ConnectingDataChannel	15	Connecting data channel
CanNotConnectDataChannel	16	Can not connect to data channel
DataChannelConnected	17	Data channel connected
ConnectDataChannelExceptionRised	18	Exception rised in connection procedure
LoadingConfiguration	19	Retrieving system configuration tables
FailToLoadConfiguration	20	Fail to receive configuration
ExceptionRised	21	Exception in procedure

byte DoorItems

Member	Value	Refer to
Door	0	Door
Lock	1	Lock
DoorAlarm	2	Door alarm

Class ConfigurationChangedArgs

Parameter	Type	Description
DeviceType	byte	Type of device. Values are enumerated in class Constants.CommandForItem
Change	byte	Type of change. Values are enumerated in Constants.ServerResponse
ItemID	Integer32	ID of the item

Class ConnectionStateArgs

Parameter	Type	Description
ConnectionState	Integer32	State of the connection with PROS Server. Values are enumerated in class Constants.ConnectionStates

Class DeviceStatusArgs

Parameter	Type	Description
DeviceType	byte	Type of device. Values are enumerated in class Constants.CommandForItem
DeviceID	Integer32	Device ID
Item	byte	If DeviceType is Door, values are enumerated in class Constants.DoorItems. For other DeviceType value is 0.
Status	Integer	Depending of the DeviceType and Item values, Status values are enumerated in Constants as in following table

DeviceType	Item	Status Values
Portal		ServerResponse.Portal_Offline
		ServerResponse.Portal_Online
Controller		ServerResponse.Controller_Offline
		ServerResponse.Controller_Online
Door	Door	Enumerated in Constants.DoorStatus
	Lock	Enumerated in Constants.LockStatus
	DoorAlarm	Enumerated in Constants.DoorAlarm
Input		Enumerated in Constants.InputState
Output		Enumerated in Constants.OutputState
System		ClientRequest.HardwareCommunication_START
		ClientRequest.HardwareCommunication_STOP

Class HardwareEventArgs

Parameter	Type	Description
EventTime	Date	Time of the event
EventsLeft	Integer16	Number of the events left in the controller memory
EventID	Integer32	Event ID, enumerated in Constants.HardwareEvents
Controller	Integer32	Controller ID
User	Integer32	User ID
Door	Integer32	Door ID
ID	Unsigned Integer32	Card ID
Reader	Integer32	Reader ID
FI	Integer32	Input ID
FO	Integer32	Output ID
Portal	Integer32	Portal ID

Class PROSEventClient

PROSEventClient is the main class of the SDK. This class provide connection with PROS Server.

PROSEventClient Properties

PROSEventClient Properties			
Property	Type	Default value	Description
ServerName	String	Demo	Can be any value, normally to identify the instance of the PROSEventClient.
ServerIP	String	localhost	IP address of the PROS Client.
EventPort	Int32	54321	Event port of the PROS Server. Value must be between 1 and 65535.
Username	String	1	Username for login to PROS Server.
UserPassword	String	1	Password for login to PROS Server.
ServerVersion	Version	Nothing	Version of the PROS Server. Value is obtained from PROS Server upon login.
ConnectionState	Int32	1	State of the connection to PROS Server. Values are enumerated in Constants.ConnectionStates.
gdtUsers	DataTable	Nothing	Data table with list of the users. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtDepartments	DataTable	Nothing	Data table with list of the Departments. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtReaders	DataTable	Nothing	Data table with list of the Readers. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtFO	DataTable	Nothing	Data table with list of the Outputs. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtFI	DataTable	Nothing	Data table with list of the Inputs. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtControlers	DataTable	Nothing	Data table with list of the Controlers. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtPortals	DataTable	Nothing	Data table with list of the Portals. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.
gdtDoors	DataTable	Nothing	Data table with list of the Doors. Table is created when connection with PROS Server is established, and destroyed when PROS Server is disconnected.

Data table gdtUsers		
Row	Data Type	Description
RedBr	Int32	User ID
Name	Text(40)	User name
Start	Date/Time	Start of the User validity
Stop	Date/Time	End of the User validity
Foto	OLE Object	User image
Department	Int32	Department ID
FCard	Byte	Role of the User. See table "Function cards" bellow.
ID	Double	Card number 1
ID1	Double	Card number 2
ID2	Double	Card number 3
ID3	Double	Card number 4
Detail1	Text(30)	Employee ID
Detail2	Text(30)	Job title
Detail3	Text(50)	Work email
Detail4	Text(30)	Work phone
Detail5	Text(30)	Work mobile
Detail6	Text(30)	Work fax
Detail7	Text(250)	Work address
Detail8	Text(10)	Blood group
Detail9	Text(50)	Private email
Detail10	Text(30)	Home phone
Detail11	Text(30)	Private mobile
Detail12	Text(250)	Home address
Detail13	Text(50)	Custom info 1
Detail14	Text(50)	Custom info 2
Detail15	Text(50)	Custom info 3
Detail16	Text(50)	Custom info 4
Detail17	Text(50)	Custom info 5
Other fields are subject to change and not to be used!		

Function cards field values	
Value	Description
0	Normal User
86	One time access user
173	Reset Door alarm
202	Reset next user Anti pass back state
234	Reset Anti pass back
240	Activate output
Users with values in "FCard" field that are not listed in this table should be ignored.	

Data table gdtDepartments		
Row	Data Type	Description
RedBr	Int32	Department ID
Name	Text(30)	Department name

Data table gdtPortals		
Row	Data Type	Description
RedBr	Int32	Portal ID
Name	Text(30)	User name

Other fields are subject to change and not to be used!

Data table gdtControlers		
Row	Data Type	Description
RedBr	Int32	Controller ID
Name	Text(30)	User name
Portal	Int32	ID of the Portal where Controller is connected

Other fields are subject to change and not to be used!

Data table gdtDoors		
Row	Data Type	Description
RedBr	Int32	Door ID
Name	Text(30)	Door name
Door	Byte	Door number in the controller
Controller	Int32	ID of the Controller where Door is connected

Other fields are subject to change and not to be used!

Data table gdtReaders		
Row	Data Type	Description
RedBr	Int32	Reader ID
Name	Text(30)	Reader name
Door	Byte	Door in the controller where reader is attached.
Reader	Byte	Reader number in the controller
Controller	Int32	ID of the Controller where Reader is connected

Other fields are subject to change and not to be used!

Data table gdtFI		
Row	Data Type	Description
RedBr	Int32	Input ID
Name	Text(30)	Input name
FI	Byte	Input number in the controller
Fire	Boolean	True = input is dedicated to fire alarm
Controller	Int32	ID of the Controller where Reader is connected

Data table gdtFI

Other fields are subject to change and not to be used!

Data table gdtFO

Row	Data Type	Description
RedBr	Int32	Output ID
Name	Text(30)	Output name
FO	Byte	Output number in the controller
Controller	Int32	ID of the Controller where Reader is connected

Other fields are subject to change and not to be used!

PROSEventClient Functions

Function	Purpose
Connect	Connect to PROS Server.
Disconnect	Disconnect from PROS Server.
RefreshDeviceStatus	Ask PROS Server to send current status of all devices in the system. It is recommended to use this command immediately after connecting to server as in provided code samples. After initial status, developer should update status of the devices as new events arrives.
SendCommand	Send command to Door or Output

○ **Function Connect**

Declaration:

```
PublicFunction Connect(ByVal OneShot As Boolean) As Integer
```

Parameters:

- OneShot:

True - PROSEventClient will try to connect to PROS Server once and will return result.

False - PROSEventClient will try to connect to PROS Server until connection is established or function Disconnect is called.

Return value:

Value for return is enumerated in Constants.ConnectionStates. Only value of Connected (0) means that connection is established.

○ **Function Disconnect**

Declaration:

```
PublicFunction Disconnect() As Boolean
```

Parameters:

- No parameters

Return value:

- True - Disconnect from PROS Server

- False - Exception rised in procedure

○ **Function RefreshDeviceStatus**

Declaration:

```
PublicFunction RefreshDevicesStatus() As Boolean
```

Parameters:

- No parameters

Return value:

- True - Request is sent to PROS Server

- False - Exception rised in procedure

○ **Function SendCommand**

Declaration:

`PublicFunction SendCommand(ItemType AsByte, ItemID AsInteger, Command As Byte) As Integer`

Parameters:

- ItemType: Select values from Constants.CommandForItem for Door or Output
- ItemID: ID of the Door or Output from the data tables
- Command: For Door select value from

Constants.ClientRequest.DoorReleaseLock/DoorLock/DoorUnlock. For Output select value from Constants.ClientRequest.OutputEnable/OutputDisable/OutputActivate/OutputON/OutputOFF.

Return value:

- Return values are enumerated in Constants.HardwareCommandsResponse

PROSEventClient Events

Event	Rise when
HardwareEvent	New event in access control system arrive from PROS Server
ChangedDeviceStatus	Device in the system change state, like Door from open to close
ConnectingStateChange	Connection state with PROS Server is changed
ConfigurationChanged	Configuration of the Access control system

○ Event HardwareEvent

Declaration:

`PublicEvent HardwareEvent(sender As Object, e As HardwareEventArgs)`

Parameters:

- sender: PROS_Event_Client_DLL
- e: argument packed in the class HardwareEventArgs

○ Event ChangedDeviceStatus

Declaration:

`PublicEvent ChangedDeviceStatus(sender As Object, e As DeviceStatusArgs)`

Parameters:

- sender: PROS_Event_Client_DLL
- e: argument packed in the class DeviceStatusArgs

○ Event ConnectingStateChange

Declaration:

`PublicEvent ConnectingStateChange(sender As Object, e As ConnectionStateArgs)`

Parameters:

- sender: PROS_Event_Client_DLL
- e: argument packed in the class ConnectionStateArgs

○ Event ConfigurationChanged

Declaration:

`PublicEvent ConfigurationChanged(sender As Object, e As ConfigurationChangedEventArgs)`

Parameters:

- sender: PROS_Event_Client_DLL
- e: argument packed in the class ConfigurationChangedEventArgs