

XDOP Device Description

Document Version 1.0

Includes Descriptions for following devices:

- urn:schemas-coscom-org:device:MCU5Treadmill:1

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Syntax

(All indices in this document are not fix and can vary in further firmware versions)

Request: *D1d0*Z

Response: 0:X_DeviceIndex=0

1:deviceType=urn:schemas-coscom-org:device:MCU5Treadmill:1

2:UDN=uuid:f1daec20-583c-11db-b0de-010012345679

3:friendlyName=Running machine

4:manufacturer=h/p/cosmos sports & medical gmbh

5:manufacturerURL=http://www.h-p-cosmos.com

6:modelName=

7:modelNumber=

8:modelDescription=

9:modelURL=

10:serialNumber=00012345679

11:EPC=

12:serviceList=

0:X_ServiceIndex=0

1:serviceType=urn:schemas-coscom-

org:service:TreadmillGeneralConfig:1

2:serviceId=urn:schemas-coscom-org:serviceId:GeneralConfig

3:UTV=uuid:6366571c-840d-4c17-8fb9-b2c91308c75e

0:X_ServiceIndex=1

1:serviceType=urn:schemas-coscom-org:service:TerminalLCD6x4Panel:1

2:serviceId=urn:schemas-coscom-org:serviceId:Terminal

3:UTV=uuid:0e0a3b9a-6375-4bbd-9867-78290dba78dd

0:X_ServiceIndex=2

1:serviceType=urn:schemas-coscom-org:service:TreadmillMeasures:1

2:serviceId=urn:schemas-coscom-org:serviceId:Measures

3:UTV=uuid:01a81afd-1f3a-4027-8b86-83f871daalce

0:X_ServiceIndex=3

1:serviceType=urn:schemas-coscom-

org:service:TreadmillUserControl:1

2:serviceId=urn:schemas-coscom-org:serviceId:UserControl

3:UTV=uuid:a0c23d32-46a8-44dd-b4cf-39aa430be4fe

0:X_ServiceIndex=4

1:serviceType=urn:schemas-coscom-

org:service:TreadmillDirectControl:1

2:serviceId=urn:schemas-coscom-org:serviceId:DirectControl

3:UTV=uuid:c77a05c3-54cf-4dba-af5b-d3de1cb39720

0:X_ServiceIndex=5

1:serviceType=urn:schemas-coscom-org:service:TreadmillOptions:1

2:serviceId=urn:schemas-coscom-org:serviceId:Options

3:UTV=uuid:0ff4baef-f7f9-4ddf-960f-fb45bf20fffc

0:X_ServiceIndex=6

1:serviceType=urn:schemas-coscom-org:service:DataLogger:1

2:serviceId=urn:schemas-coscom-org:serviceId:Logger

3:UTV=uuid:fa6b06f5-6639-414b-8312-a4370c09501f

0:X_ServiceIndex=7

1:serviceType=urn:schemas-coscom-

org:service:TreadmillProfileEditor:1

2:serviceId=urn:schemas-coscom-org:serviceId:Profiles

3:UTV=uuid:7c5b3fe0-c1e4-4f4d-b272-fc587af09ca2

0:X_ServiceIndex=8

1:serviceType=urn:schemas-coscom-

org:service:SunTechTangoStressBPBridge:1

2:serviceId=urn:schemas-coscom-org:serviceId:TangoBP

```

3:UTV=uuid:92031c16-f347-41d0-8824-2bf45c1add98
0:X_ServiceIndex=9
1:serviceType=urn:schemas-coscom-org:service:MCU5FlashUpdate:1
2:serviceId=urn:schemas-coscom-org:serviceId:MCU5FlashUpdate
3:UTV=uuid:3a50dbfe-3377-11dc-8314-0800200c9a66

```

Device Properties

Property name	Value
DeviceType	urn:schemas-coscom-org:device:MCU5Treadmill: 1
DeviceIndex	0
EPC	
FriendlyName	Treadmill
Manufacturer	h/p/cosmos
ManufacturerURL	www.h-p-cosmos.com
ModelDescription	
ModelName	
ModelNumber	
ModelURL	
SerialNumber	

Device Services

Following table enumerates the service types of the device.

Service type	Service index
urn:schemas-coscom-org:service:TreadmillProfileEditor: 1	7
urn:schemas-coscom-org:service:DataLogger: 1	6
urn:schemas-coscom-org:service:SunTechTangoStressBPBridge: 1	8
urn:schemas-coscom-org:service:TreadmillGeneralConfig: 1	0
urn:schemas-coscom-org:service:TreadmillOptions: 1	5
urn:schemas-coscom-org:service:TreadmillDirectControl: 1	4
urn:schemas-coscom-org:service:TreadmillUserControl: 1	3
urn:schemas-coscom-org:service:TreadmillMeasures: 1	2
urn:schemas-coscom-org:service:TerminalLCD6x4Panel: 1	1
urn:schemas-coscom-org:service:MCU5FlashUpdate: 1	9

1.1 Service urn:schemas-coscom-org:serviceId:Profiles

With the profile editor all stored profiles can be read and the user profiles can be edited and saved. There are three types of profiles in the treadmill:

- Scalable profiles, which can be started in the mode "profile". This profiles are read-only.

Profile numbers:

1 to 6

- Test profiles, which provide specific tests. This profiles are read-only.

Profile numbers:

4 = Bruce
5 = Naughton
6 = Balke
8 = Ellestad A
9 = Ellestad B
21 = User Test Profile 1
22 = User Test Profile 1
23 = User Test Profile 1
24 = User Test Profile 1
70 = MBAFC Interval 600m / 14.5 - 17.5 km/h
71 = MBAFC Interval 500m / 15 - 19 km/h
72 = MBAFC Interval 400m / 16 - 21 km/h
73 = MBAFC Interval 300-600m / 15 - 21 km/h
74 = MBAFC Interval 300-600m / 15 - 21 km/h
75 = MBAFC Interval 300m / 20 km/h
76 = walk protocol 13 steps
80 = VO2 / 10K
81 = VO2 / 11K
82 = VO2 / 12K
84 = VO2 / 14K
85 = SUPER BALKE
90 = Test 90
91 = Test 91
92 = Test 92
93 = Test 93
94 = Test 94
99 = Burn-in

- User profiles, which can be edited and saved.

Profile numbers:

21 to 24 MCU4 (MCU5 28)

Syntax

```
Request: *D2s7d0*Z
Response: 0:X_ServiceIndex=7
          1:serviceType=urn:schemas-coscom-
            org:service:TreadmillProfileEditor:1
          2:serviceId=urn:schemas-coscom-org:serviceId:Profiles
          3:UTV=uuid:7c5b3fe0-c1e4-4f4d-b272-fc587af09ca2
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=GetProfileHeader
```

```
2:argumentList=
0:X_ArgumentIndex=0
1:name=profileType
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=steps
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=3
1:name=intervalType
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=4
1:name=intervalSum
2:direction=out
5:dataType=ui2
0:X_ArgumentIndex=5
1:name=maxSpeed
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=6
1:name=maxGrade
2:direction=out
5:dataType=r4
0:X_ActionIndex=1
1:name=ReadProfileStep
2:argumentList=
0:X_ArgumentIndex=0
1:name=profileType
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=step
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=3
1:name=intervalType
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=4
1:name=interval
2:direction=out
5:dataType=ui2
0:X_ArgumentIndex=5
1:name=speed
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=6
1:name=accelIndex
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=7
1:name=grade
2:direction=out
```



```

5:dataType=r4
0:X_ActionIndex=2
1:name=WriteUserProfileStep
2:argumentList=
0:X_ArgumentIndex=0
1:name=number
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=step
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=intervalType
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=interval
2:direction=in
5:dataType=ui2
0:X_ArgumentIndex=4
1:name=speed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=5
1:name=accelIndex
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=6
1:name=grade
2:direction=in
5:dataType=r4
7:variableList=

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:Profiles
ServiceIndex	7
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TreadmillProfileEditor: 1

Service Variables

No Variables

Service Methods

Name	Index	Description
GetProfileHeader	0	Gets profile header information.
ReadProfileStep	1	Reads profile step information.
WriteUserProfileStep	2	Writes user test profile step information.

Service error codes

Error code	Error description
800	Not in select mode

804	Invalid profile
813	Invalid test number
821	Invalid step
822	Invalid profile type

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.1.1 Actions

1.1.1.1 Action GetProfileHeader

Gets profile header information.

Syntax

```
Request: *A0s7d0*I0:profileType*I1:number*Z
Response: *A0s7d0*O2:steps*O3:intervalType*O4:intervalSum*O5:maxSpeed*O6:
          maxGrade*Z
```

Parameters

profileType (ui1)

Profile type:

- 0 = Factory profile (scalable)
- 1 = Test profile
- 2 = User profile

number (ui1)

Profile identification number

steps (ui1)

Number of steps (max. step index)

intervalType (ui1)

Interval type:

- 0 = mixed
- 1 = Time
- 2 = Distance

intervalSum (ui2)

Sum of all step intervals (interval type is time or distance)

maxSpeed (r4)

Maximum speed of all steps

maxGrade (r4)

Maximum grade of all steps

Remarks

The returned header informations is type-dependent:

Profile type: 0 = Factory profile (scalable)

steps = number of stored steps

intervalType = Time (1) or Distance (2)

maxSpeed = maximum speed of all steps

maxGrade = maximum grade of all steps

Profile type: 1 = Test profile

steps = number of stored steps

intervalType = Mixed (0)

maxSpeed = 0 (no header information available)

maxGrade = 0 (no header information available)

Profile type: 2 = User profile

steps = 10 (maximum possible number, not the actual number!)

intervalType = Mixed (0)

maxSpeed = 0 (no header information available)

maxGrade = 0 (no header information available)

Action Errors

822	Invalid profile type
804	Invalid profile
800	Not in select mode
813	Invalid test number

1.1.1.2 Action ReadProfileStep

Reads profile step information.

Syntax

Request: *A1s7d0*I0:profileType*I1:number*I2:step*Z

Response: *A1s7d0*03:intervalType*04:interval*05:speed*06:accelIndex*07:grade*Z

Parameters

profileType (ui1)

Profile type:

0 = Factory profile (scalable)

1 = Test profile

2 = User profile

number (ui1)

Profile identification number

step (ui1)

Step index (1 ... max. steps)

intervalType (ui1)

Interval type:

1 = Time

2 = Distance

interval (ui2)

Time [s] or distance [m]

speed (r4)

Speed [m/s]

accelIndex (ui1)

Acceleration index (1 to 4)

grade (r4)

Grade [%]

Action Errors

822	Invalid profile type
804	Invalid profile
821	Invalid step
800	Not in select mode
813	Invalid test number

1.1.1.3 Action WriteUserProfileStep

Writes user test profile step information.

Syntax

```
Request: *A2s7d0*I0:number*I1:step*I2:intervalType*I3:interval*I4:speed*I5:
        accelIndex*I6:grade*Z
Response: *A2s7d0*Z
```

Parameters

number (ui1)

Profile identification number

step (ui1)

Step index (1 ... max. steps)

intervalType (ui1)

Interval type:

1 = Time

2 = Distance

interval (ui2)

Time [s] or distance [m]

speed (r4)

Speed [m/s]

accelIndex (ui1)

Acceleration index (1 to 4)

grade (r4)

Grade [%]

Action Errors

804	Invalid profile
821	Invalid step
800	Not in select mode

1.2 Service urn:schemas-coscom-org:serviceId:Logger

This service provides a configurable data logger. The output of the logger is evented.

Syntax

```
Request: *D2s6d0*Z
Response: 0:X_ServiceIndex=6
          1:serviceType=urn:schemas-coscom-org:service:DataLogger:1
          2:serviceId=urn:schemas-coscom-org:serviceId:Logger
          3:UTV=uuid:fa6b06f5-6639-414b-8312-a4370c09501f
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=SetRecordColumns
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=columnList
          2:direction=in
          5:dataType=string
          0:X_ActionIndex=1
          1:name=SetColumnDelimiter
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=delimiter
          2:direction=in
          5:dataType=char
          0:X_ActionIndex=2
          1:name=SetRecordEventPeriod
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=period
          2:direction=in
          5:dataType=uil
          0:X_ActionIndex=3
          1:name=StartLogging
          0:X_ActionIndex=4
          1:name=StopLogging
          7:variableList=
          0:X_VariableIndex=0
          1:name=Record
          2:dataType=string
          4:flags=QE
```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:Logger
ServiceIndex	6
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:DataLogger:1

Service Variables

Type	Name	Index	Flags	Description
string	Record	0	E Q	Record string with all configured column values

Service Methods

Name	Index	Description
SetColumnDelimiter	1	Sets the column delimiter character.
SetRecordColumns	0	Sets the columns for the log record.
SetRecordEventPeriod	2	Sets the event period.
StartLogging	3	Starts the logging.
StopLogging	4	Stops the logging.

Service error codes

No error codes defined

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.2.1 Actions

1.2.1.1 Action SetColumnDelimiter

Sets the column delimiter character.

Syntax

```
Request: *A1s6d0*I0:delimiter*Z  
Response: *A1s6d0*Z
```

Parameters

delimiter (char)

Delimiter character for delimiting the column values in the log record

Remarks

Comment for Action SetColumnDelimiter

1.2.1.2 Action SetRecordColumns

Sets the columns for the log record.

Syntax

```
Request: *A0s6d0*I0:columnList*Z  
Response: *A0s6d0*Z
```

Parameters

columnList (string)

String with semi-colon separated indexes of columns, which should be logged:

- 1 = Time
- 2 = Distance
- 3 = Speed
- 4 = Grade
- 5 = Heart Rate
- 6 = Power
- 7 = Energy
- 8 = MET

Example: 1;3;4 for time, speed and grade

1.2.1.3 Action SetRecordEventPeriod

Sets the event period.

Syntax

```
Request: *A2s6d0*I0:period*Z  
Response: *A2s6d0*Z
```


Parameters

period (ui1)

Event period (time between two log record outputs) [s]

1.2.1.4 Action StartLogging

Starts the logging.

Syntax

Request: *A3s6d0*Z

Response: *A3s6d0*Z

1.2.1.5 Action StopLogging

Stops the logging.

Syntax

Request: *A4s6d0*Z

Response: *A4s6d0*Z

1.3 Service urn:schemas-coscom-org:serviceId:TangoBP

This service manages a communication bridge to the SunTech Tango Blood Pressure device. If the Tango device is connected with one of the other serial ports, it can be controlled with the actions of this service.

See SunTech Tango manual for more details or contact h/p/cosmos.

Syntax

```
Request: *D2s8d0*Z
Response: 0:X_ServiceIndex=8
          1:serviceType=urn:schemas-coscom-
            org:service:SunTechTangoStressBPBridge:1
          2:serviceId=urn:schemas-coscom-org:serviceId:TangoBP
          3:UTV=uuid:92031c16-f347-41d0-8824-2bf45c1add98
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
            0:X_ActionIndex=0
            1:name=BeginBPStudy
            0:X_ActionIndex=1
            1:name=StartBPSample
            0:X_ActionIndex=2
            1:name=StopBPSample
            0:X_ActionIndex=3
            1:name=RecallBPValues
            0:X_ActionIndex=4
            1:name=EndBPStudy
            0:X_ActionIndex=5
            1:name=ClearBPReadings
          7:variableList=
            0:X_VariableIndex=0
            1:name=Message
            2:dataType=string
            4:flags=QE
```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:TangoBP
ServiceIndex	8
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom- org:service:SunTechTangoStressBPBridge:1

Service Variables

Type	Name	Index	Flags	Description
string	Message	0	E Q	Message string from the Tango blood pressure device

Service Methods

Name	Index	Description
BeginBPStudy	0	Begin blood pressure study.
ClearBPReadings	5	Clear blood pressure readings.
EndBPStudy	4	End blood pressure study.

RecallBPValues	3	Recall blood pressure values.
StartBPSample	1	Start blood pressure sample.
StopBPSample	2	Stop blood pressure sample.

Service error codes

Error code	Error description
823	No SunTech BP monitor

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.3.1 Actions

1.3.1.1 Action BeginBPStudy

Begin blood pressure study.

Syntax

Request: *A0s8d0*Z

Response: *A0s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.3.1.2 Action ClearBPReadings

Clear blood pressure readings.

Syntax

Request: *A5s8d0*Z

Response: *A5s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.3.1.3 Action EndBPStudy

End blood pressure study.

Syntax

Request: *A4s8d0*Z

Response: *A4s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.3.1.4 Action RecallBPValues

Recall blood pressure values.

Syntax

Request: *A3s8d0*Z

Response: *A3s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.3.1.5 Action StartBPSample

Start blood pressure sample.

Syntax

Request: *A1s8d0*Z

Response: *A1s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.3.1.6 Action StopBPSample

Stop blood pressure sample.

Syntax

Request: *A2s8d0*Z

Response: *A2s8d0*Z

Action Errors

823	No SunTech BP monitor
-----	-----------------------

1.4 Service urn:schemas-coscom-org:serviceId:GeneralConfig

This service can be used to get general information about the treadmill and to make general configurations.

Syntax

```
Request: *D2s0d0*Z
Response: 0:X_ServiceIndex=0
          1:serviceType=urn:schemas-coscom-
            org:service:TreadmillGeneralConfig:1
          2:serviceId=urn:schemas-coscom-org:serviceId:GeneralConfig
          3:UTV=uuid:6366571c-840d-4c17-8fb9-b2c91308c75e
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=SetProtocolParams
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=processChecksum
          2:direction=in
          5:dataType=boolean
          0:X_ArgumentIndex=1
          1:name=appendCRLF
          2:direction=in
          5:dataType=boolean
          0:X_ArgumentIndex=2
          1:name=outputDescNames
          2:direction=in
          5:dataType=boolean
          0:X_ActionIndex=1
          1:name=GetFirmwareVersion
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=version
          2:direction=out
          5:dataType=string
          0:X_ActionIndex=2
          1:name=GetType
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=type
          2:direction=out
          5:dataType=ui1
          0:X_ArgumentIndex=1
          1:name=subType
          2:direction=out
          5:dataType=ui1
          0:X_ActionIndex=3
          1:name=GetOEMCode
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=code
          2:direction=out
          3:retval=
          5:dataType=ui1
          0:X_ActionIndex=4
          1:name=GetDefaultType
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=type
```

```
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=subType
2:direction=out
5:dataType=ui1
0:X_ActionIndex=5
1:name=SetFailSafeTimeout
2:argumentList=
0:X_ArgumentIndex=0
1:name=newTimeout
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=oldTimeout
2:direction=out
5:dataType=ui1
0:X_ActionIndex=6
1:name=GetRTCTime
2:argumentList=
0:X_ArgumentIndex=0
1:name=sec
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=min
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=hrs
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=day
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=4
1:name=month
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=5
1:name=year
2:direction=out
5:dataType=ui2
0:X_ActionIndex=7
1:name=SetRTCTime
2:argumentList=
0:X_ArgumentIndex=0
1:name=sec
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=min
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=hrs
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=day
2:direction=in
5:dataType=ui1
```

```
0:X_ArgumentIndex=4
1:name=month
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=5
1:name=year
2:direction=in
5:dataType=ui2
0:X_ActionIndex=8
1:name=GetSerialNumber
2:argumentList=
0:X_ArgumentIndex=0
1:name=code1
2:direction=out
5:dataType=char
0:X_ArgumentIndex=1
1:name=code2
2:direction=out
5:dataType=char
0:X_ArgumentIndex=2
1:name=code3
2:direction=out
5:dataType=char
0:X_ArgumentIndex=3
1:name=num8
2:direction=out
5:dataType=ui4
0:X_ActionIndex=9
1:name=SetSerialNumber
2:argumentList=
0:X_ArgumentIndex=0
1:name=code1
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=code2
2:direction=in
5:dataType=char
0:X_ArgumentIndex=2
1:name=code3
2:direction=in
5:dataType=char
0:X_ArgumentIndex=3
1:name=num8
2:direction=in
5:dataType=ui4
0:X_ArgumentIndex=4
1:name=key1
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=5
1:name=key2
2:direction=in
5:dataType=ui1
0:X_ActionIndex=10
1:name=GetLockMask
2:argumentList=
0:X_ArgumentIndex=0
1:name=mask
2:direction=out
3:retval=
5:dataType=bin.hex
0:X_ActionIndex=11
```



```

1:name=GetErrors
2:argumentList=
0:X_ArgumentIndex=0
1:name=controlError
2:direction=out
4:relatedVariable=Error
0:X_ArgumentIndex=1
1:name=driveError
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=2
1:name=elevatorError
2:direction=out
5:dataType=uil
7:variableList=
0:X_VariableIndex=0
1:name=Error
2:dataType=uil
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:GeneralConfig
ServiceIndex	0
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TreadmillGeneralConfig:1

Service Variables

Type	Name	Index	Flags	Description
ui1	Error	0	E Q	General control error. See action GetErrors for more details.

Service Methods

Name	Index	Description
GetDefaultType	4	Gets the default type and sub type, which has been set by the factory. This values are important, if the configuration parameters (options) of the treadmill are lost (e.g. the battery of the Real-Time-Clock has been replaced or the signature of the configuration memory is false).
GetErrors	11	Gets all three types of error codes: user control error, drive error and elevator error.
GetFirmwareVersion	1	Gets the firmware version.
GetLockMask	10	Gets the lock bit mask. Each bit presents a lock for a control mode. If a control mode is locked, the user cannot select and start this mode.
GetOEMCode	3	Gets the OEM code of this treadmill. Please contact h/p/cosmos for further details.
GetRTCTime	6	Gets the time fields of the battery-buffered real time clock.

GetSerialNumber	8	Get the serial number of the treadmill. Contact h/p/cosmos for details.
GetType	2	Gets the type and sub type (treadmill type and variant). Contact h/p/cosmos for a list of all available types and sub types.
SetFailSafeTimeout	5	This is a very important action, which should be used to set a failsafe timeout before the treadmill is remote controlled.
SetProtocolParams	0	Sets optional protocol parameters.
SetRTCTime	7	Gets the time fields of the battery-buffered real time clock.
SetSerialNumber	9	Get the serial number of the treadmill. Contact h/p/cosmos for details. This action needs two access keys for a successful change.

Service error codes

Error code	Error description
801	Wrong access keys

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.4.1 Actions

1.4.1.1 Action GetDefaultType

Gets the default type and sub type, which has been set by the factory. This values are important, if the configuration parameters (options) of the treadmill are lost (e.g. the battery of the Real-Time-Clock has been replaced or the signature of the configuration memory is false).

Syntax

```
Request: *A4s0d0*Z  
Response: *A4s0d0*00:type*01:subType*Z
```

Parameters

type (ui1)
Major type (major treadmill type)

subType (ui1)
Sub type (treadmill type variant)

1.4.1.2 Action GetErrors

Gets all three types of error codes: user control error, drive error and elevator error.

Syntax

```
Request: *A11s0d0*Z  
Response: *A11s0d0*00:controlError*01:driveError*02:elevatorError*Z
```

Parameters

controlError (ui1)
General control error

driveError (ui1)
Drive error

elevatorError (ui1)
Elevator error

Remarks

Control errors:

- 0 = No error
- 1 = Oil interval passed
- 2 = Service interval passed
- 20 = Elevator top crash
- 21 = Elevator increment error
- 30 = Drive increment error
- 41 = RTC initialized (backup battery weak)
- 50 = FU error

Drive errors:

- 0 = No error
- 1 = Drive increment error (= > control error 30)
- 2 = FU error (= > control error 50)

Elevator errors:

- 0 = No error
- 1 = Elevator increment error (= > control error 21)
- 2 = Elevator top crash (= > control error 20)

1.4.1.3 Action GetFirmwareVersion

Gets the firmware version.

Syntax

```
Request: *A1s0d0*Z
Response: *A1s0d0*00:version*Z
```

Parameters

version (string)
String with 4 digits (e.g. 4011)

1.4.1.4 Action GetLockMask

Gets the lock bit mask. Each bit presents a lock for a control mode. If a control mode is locked, the user cannot select and start this mode.

Syntax

```
Request: *A10s0d0*Z
Response: *A10s0d0*00:mask*Z
```

Parameters

mask (bin.hex)
Lock mask:
0x0F = General
0x10 = Manual
0x20 = Profile
0x40 = Cardio
0x80 = Test

1.4.1.5 Action GetOEMCode

Gets the OEM code of this treadmill. Please contact h/p/cosmos for further details.

Syntax

```
Request: *A3s0d0*Z  
Response: *A3s0d0*00:code*Z
```

Parameters

code (ui1)
OEM code number

1.4.1.6 Action GetRTCTime

Gets the time fields of the battery-buffered real time clock.

Syntax

```
Request: *A6s0d0*Z  
Response: *A6s0d0*00:sec*01:min*02:hrs*03:day*04:month*05:year*Z
```

Parameters

sec (ui1)
RTC seconds: 0 - 59

min (ui1)
RTC minutes: 0 - 59

hrs (ui1)
RTC hours: 0 - 23

day (ui1)
RTC day: 1 - 31

month (ui1)
RTC month: 1 - 12

year (ui2)
RTC year: 2000 - 2099

1.4.1.7 Action GetSerialNumber

Get the serial number of the treadmill. Contact h/p/cosmos for details.

Syntax

```
Request: *A8s0d0*Z  
Response: *A8s0d0*00:code1*01:code2*02:code3*03:num8*Z
```

Parameters

code1 (char)

Code character 1

code2 (char)

Code character 2

code3 (char)

Code character 2

num8 (ui4)

Serial number between 0 and 99999999

1.4.1.8 Action GetType

Gets the type and sub type (treadmill type and variant). Contact h/p/cosmos for a list of all available types and sub types.

Syntax

Request: *A2s0d0*Z

Response: *A2s0d0*00:type*01:subType*Z

Parameters

type (ui1)

Major type (major treadmill type)

subType (ui1)

Sub type (treadmill type variant)

1.4.1.9 Action SetFailSafeTimeout

This is a very important action, which should be used to set a failsafe timeout before the treadmill is remote controlled.

Syntax

Request: *A5s0d0*I0:newTimeout*Z

Response: *A5s0d0*01:oldTimeout*Z

Parameters

newTimeout (ui1)

New timeout value in 1/10 seconds (0 to 25.5 seconds)

oldTimeout (ui1)

Old timeout value in 1/10 seconds (0 to 25.5 seconds)

Remarks

A timeout value of 0 disables the timeout timer and a timeout value between 1 and 255 (0.1 to 25.5 seconds) enables the timer.

The timeout timer increments every 100 milliseconds.

If the set timeout value is reached, the treadmill is stopped (drive and elevator are stopped and the current mode is leaved).

The timeout timer resets and doesn't count up, if the drive is stopped and the elevator doesn't go up or down.

For safety reasons the timeout value should always be set, if the speed or the elevation of the treadmill is changed by an action message.

A reasonable value for the timeout is 1 second (timeout value = 10).

1.4.1.10 Action SetProtocolParams

Sets optional protocol parameters.

Syntax

```
Request: *A0s0d0*I0:processChecksum*I1:appendCRLF*I2:outputDescNames*Z  
Response: *A0s0d0*Z
```

Parameters

processChecksum (boolean)

Enables the processing of an 2 hex digit (modulo 256) checksum with element Y0.

appendCRLF (boolean)

Appends the characters CR and LF at the end of a message (after *Z).

outputDescNames (boolean)

Enables the output of the optional index names in the description lines.

1.4.1.11 Action SetRTCTime

Gets the time fields of the battery-buffered real time clock.

Syntax

```
Request: *A7s0d0*I0:sec*I1:min*I2:hrs*I3:day*I4:month*I5:year*Z  
Response: *A7s0d0*Z
```

Parameters

sec (ui1)

RTC seconds: 0 - 59

min (ui1)

RTC minutes: 0 - 59

hrs (ui1)
RTC hours: 0 - 23

day (ui1)
RTC day: 1 - 31

month (ui1)
RTC month: 1 - 12

year (ui2)
RTC year: 2000 - 2099

1.4.1.12 Action SetSerialNumber

Get the serial number of the treadmill. Contact h/p/cosmos for details. This action needs two access keys for a successful change.

Syntax

Request: *A9s0d0*I0:*code1**I1:*code2**I2:*code3**I3:*num8**I4:*key1**I5:*key2**Z
Response: *A9s0d0*Z

Parameters

code1 (char)
Code character 1

code2 (char)
Code character 2

code3 (char)
Code character 3

num8 (ui4)
Serial number between 0 and 99999999

key1 (ui1)
Access key 1

key2 (ui1)
Access key 2

Action Errors

801	Wrong access keys
-----	-------------------

1.5 Service urn:schemas-coscom-org:serviceId:Options

This is a management service for all optional configuration settings and values.

Syntax

Request: *D2s5d0*Z

Response: 0:X_ServiceIndex=5
1:serviceType=urn:schemas-coscom-org:service:TreadmillOptions:1
2:serviceId=urn:schemas-coscom-org:serviceId:Options
3:UTV=uuid:0ff4baef-f7f9-4ddf-960f-fb45bf20fffc
4:majorVersion=1
5:minorVersion=1
6:actionList=
0:X_ActionIndex=0
1:name=GetVersion
2:argumentList=
0:X_ArgumentIndex=0
1:name=version
2:direction=out
5:dataType=string
0:X_ActionIndex=1
1:name=GetOption
2:argumentList=
0:X_ArgumentIndex=0
1:name=level
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=value
2:direction=out
5:dataType=i4
0:X_ArgumentIndex=3
1:name=min
2:direction=out
5:dataType=i4
0:X_ArgumentIndex=4
1:name=max
2:direction=out
5:dataType=i4
0:X_ActionIndex=2
1:name=SetOption
2:argumentList=
0:X_ArgumentIndex=0
1:name=level
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=value
2:direction=in
5:dataType=i4
0:X_ArgumentIndex=3
1:name=key1
2:direction=in

```

5:dataType=uil
0:X_ArgumentIndex=4
1:name=key2
2:direction=in
5:dataType=uil
0:X_ActionIndex=3
1:name=GetListSize
2:argumentList=
0:X_ArgumentIndex=0
1:name=level
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=size
2:direction=out
5:dataType=uil
0:X_ActionIndex=4
1:name=GetListEntry
2:argumentList=
0:X_ArgumentIndex=0
1:name=level
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=number
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=index
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=3
1:name=value
2:direction=out
5:dataType=i4
7:variableList=

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:Options
ServiceIndex	5
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TreadmillOptions: 1

Service Variables

No Variables

Service Methods

Name	Index	Description
GetListEntry	4	Gets an entry from a list.
GetListSize	3	Gets the number of entries in a list.

GetOption	1	Gets an option value and its range.
GetVersion	0	Gets the version of the options.
SetOption	2	Sets an option value.

Service error codes

Error code	Error description
800	Not in select mode
801	Wrong access keys
824	Unknown option number
825	Unknown option error
826	Option value out of range
827	Invalid option list index
828	Invalid option level
829	No option list available
833	Current communication protocol cannot be changed

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.5.1 Actions

1.5.1.1 Action GetListEntry

Gets an entry from a list.

Syntax

Request: *A4s5d0*I0:level*I1:number*I2:index*Z
Response: *A4s5d0*O3:value*Z

Parameters

level (char)

Option level:

'A' = Administrator

'U' = User

number (ui1)

Option identification number or 0 for a list with all options

index (ui1)

List index (0 to GetListSize() - 1)

value (i4)

List entry value

Action Errors

828	Invalid option level
824	Unknown option number
829	No option list available
800	Not in select mode
825	Unknown option error
827	Invalid option list index

1.5.1.2 Action GetListSize

Gets the number of entries in a list.

Syntax

Request: *A3s5d0*I0:level*I1:number*Z
Response: *A3s5d0*O2:size*Z

Parameters

level (char)

Option level:

'A' = Administrator

'U' = User

number (ui1)

Option identification number or 0 for options list

size (ui1)

Number of entries in the list

Action Errors

828	Invalid option level
824	Unknown option number
829	No option list available
800	Not in select mode
825	Unknown option error

1.5.1.3 Action GetOption

Gets an option value and its range.

Syntax

Request: `*A1s5d0*I0:level*I1:number*Z`
Response: `*A1s5d0*O2:value*O3:min*O4:max*Z`

Parameters

level (char)

Option level:

'A' = Administrator

'U' = User

number (ui1)

Option identification number

value (i4)

Actual option value

min (i4)

Minimum option value

max (i4)

Maximum option value

Action Errors

828	Invalid option level
824	Unknown option number
800	Not in select mode
825	Unknown option error

1.5.1.4 Action GetVersion

Gets the version of the options.

Syntax

Request: `*A0s5d0*Z`
Response: `*A0s5d0*O0:version*Z`

Parameters

version (string)

Version string e.g. "101"

1.5.1.5 Action SetOption

Sets an option value.

Syntax

Request: *A2s5d0*I0:level*I1:number*I2:value*I3:key1*I4:key2*Z
Response: *A2s5d0*Z

Parameters

level (char)

Option level:

'A' = Administrator

'U' = User

number (ui1)

Option identification number

value (i4)

New option value

key1 (ui1)

Access key 1

key2 (ui1)

Access key 2

Action Errors

828	Invalid option level
824	Unknown option number
800	Not in select mode
826	Option value out of range
825	Unknown option error
833	Current communication protocol cannot be changed
801	Wrong access keys

1.6 Service urn:schemas-coscom-org:serviceId:DirectControl

The direct control service has actions to control the speed of the drive and the grade of the elevator directly.

Syntax

```
Request: *D2s4d0*Z
Response: 0:X_ServiceIndex=4
          1:serviceType=urn:schemas-coscom-
            org:service:TreadmillDirectControl:1
          2:serviceId=urn:schemas-coscom-org:serviceId:DirectControl
          3:UTV=uuid:c77a05c3-54cf-4dba-af5b-d3de1cb39720
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=GetDriveStatus
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=driveStatus
          2:direction=out
          4:relatedVariable=DriveStatus
          0:X_ArgumentIndex=1
          1:name=actualSpeed
          2:direction=out
          4:relatedVariable=ActualSpeed
          0:X_ArgumentIndex=2
          1:name=finalSpeed
          2:direction=out
          4:relatedVariable=FinalSpeed
          0:X_ArgumentIndex=3
          1:name=acceleration
          2:direction=out
          4:relatedVariable=Acceleration
          0:X_ActionIndex=1
          1:name=GetElevatorStatus
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=elevatorStatus
          2:direction=out
          4:relatedVariable=ElevatorStatus
          0:X_ArgumentIndex=1
          1:name=actualGrade
          2:direction=out
          4:relatedVariable=ActualGrade
          0:X_ArgumentIndex=2
          1:name=finalGrade
          2:direction=out
          4:relatedVariable=FinalGrade
          0:X_ActionIndex=2
          1:name=SetDriveSpeed
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=speed
          2:direction=in
          4:relatedVariable=FinalSpeed
          0:X_ArgumentIndex=1
          1:name=accelIndex
          2:direction=in
          5:dataType=uil
          0:X_ArgumentIndex=2
```

```
1:name=acceleration
2:direction=in
4:relatedVariable=Acceleration
0:X_ActionIndex=3
1:name=SetElevatorGrade
2:argumentList=
0:X_ArgumentIndex=0
1:name=grade
2:direction=in
4:relatedVariable=FinalGrade
0:X_ActionIndex=4
1:name=GetDriveSpeedRange
2:argumentList=
0:X_ArgumentIndex=0
1:name=minSpeed
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=1
1:name=maxSpeed
2:direction=out
5:dataType=r4
0:X_ActionIndex=5
1:name=GetDriveAccelDecelRange
2:argumentList=
0:X_ArgumentIndex=0
1:name=minIndex
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=maxIndex
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=minValue
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=3
1:name=maxValue
2:direction=out
5:dataType=r4
0:X_ActionIndex=6
1:name=GetElevatorGradeRange
2:argumentList=
0:X_ArgumentIndex=0
1:name=minGrade
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=1
1:name=maxGrade
2:direction=out
5:dataType=r4
7:variableList=
0:X_VariableIndex=0
1:name=Acceleration
2:dataType=r4
4:flags=QE
0:X_VariableIndex=1
1:name=ActualGrade
2:dataType=r4
4:flags=QE
0:X_VariableIndex=2
1:name=ActualSpeed
2:dataType=r4
```



```

4:flags=QE
0:X_VariableIndex=3
1:name=DriveStatus
2:dataType=ui1
4:flags=QE
0:X_VariableIndex=4
1:name=ElevatorStatus
2:dataType=ui1
4:flags=QE
0:X_VariableIndex=5
1:name=FinalGrade
2:dataType=r4
4:flags=QE
0:X_VariableIndex=6
1:name=FinalSpeed
2:dataType=r4
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:DirectControl
ServiceIndex	4
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TreadmillDirectControl:1

Service Variables

Type	Name	Index	Flags	Description
r4	Acceleration	0	E Q	Actual acceleration (>0) deceleration (<0) value [m/s ²]
r4	ActualGrade	1	E Q	Actual grade value [%]
r4	ActualSpeed	2	E Q	Actual speed value [m/s]
ui1	DriveStatus	3	E Q	Actual drive status: 0 = Stopped (RFR off) 1 = Constant speed 2 = Acceleration 3 = Deceleration
ui1	ElevatorStatus	4	E Q	Actual elevator status: 0 = Off 1 = Up 2 = Down
r4	FinalGrade	5	E Q	Final grade value [%]
r4	FinalSpeed	6	E Q	Final speed value [m/s]

Service Methods

Name	Index	Description
GetDriveAccelDecelRange	5	Gets the configured acceleration/deceleration range.
GetDriveSpeedRange	4	Gets the configured speed range.
GetDriveStatus	0	Gets drive status values.
GetElevatorGradeRange	6	Gets the configured grade range.
GetElevatorStatus	1	Gets elevator status values.

SetDriveSpeed	2	Sets a new drive speed and an acceleration/deceleration value.
SetElevatorGrade	3	Sets a new grade value.

Service error codes

Error code	Error description
831	Speed out of range
832	Grade out of range

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.6.1 Actions

1.6.1.1 Action GetDriveAccelDecelRange

Gets the configured acceleration/deceleration range.

Syntax

Request: *A5s4d0*Z

Response: *A5s4d0*00:minIndex*01:maxIndex*02:minValue*03:maxValue*Z

Parameters

minIndex (ui1)

Minimum acceleration/deceleration index value

maxIndex (ui1)

Maximum acceleration/deceleration index value

minValue (r4)

Minimum acceleration/deceleration value [m/s²]

maxValue (r4)

Maximum acceleration/deceleration value [m/s²]

1.6.1.2 Action GetDriveSpeedRange

Gets the configured speed range.

Syntax

Request: *A4s4d0*Z

Response: *A4s4d0*00:minSpeed*01:maxSpeed*Z

Parameters

minSpeed (r4)

Minimum speed [m/s]

maxSpeed (r4)

Maximum speed [m/s]

1.6.1.3 Action GetDriveStatus

Gets drive status values.

Syntax

Request: *A0s4d0*Z

Response: *A0s4d0*00:driveStatus*01:actualSpeed*02:finalSpeed*03:acceleration*Z

Parameters

driveStatus (ui1)

Drive status:
0 = Stopped (RFR off)
1 = Constant speed
2 = Acceleration
3 = Deceleration

actualSpeed (r4)
Actual Speed [m/s]

finalSpeed (r4)
Final speed [m/s]

acceleration (r4)
Acceleration [m/s²]

1.6.1.4 Action GetElevatorGradeRange

Gets the configured grade range.

Syntax

Request: *A6s4d0*Z
Response: *A6s4d0*00:minGrade*01:maxGrade*Z

Parameters

minGrade (r4)
Minimum grade [%]

maxGrade (r4)
Maximum grade [%]

1.6.1.5 Action GetElevatorStatus

Gets elevator status values.

Syntax

Request: *A1s4d0*Z
Response: *A1s4d0*00:elevatorStatus*01:actualGrade*02:finalGrade*Z

Parameters

elevatorStatus (ui1)
Elevator status:
0 = Off
1 = Up
2 = Down

actualGrade (r4)
Actual Grade [%]

finalGrade (r4)
Final Grade [%]

1.6.1.6 Action SetDriveSpeed

Sets a new drive speed and an acceleration/deceleration value.

Syntax

Request: *A2s4d0*I0:*speed**I1:*accelIndex**I2:*acceleration**Z

Response: *A2s4d0*Z

Parameters

speed (r4)

Final Speed [m/s]

accelIndex (ui1)

Acceleration index:

0 = Use "acceleration" argument

1 = (Max. FU speed) / 131 s

2 = (Max. FU speed) / 65.5 s

3 = (Max. FU speed) / 32.8 s

4 = (Max. FU speed) / 16.0 s

5 = (Max. FU speed) / 8.0 s

6 = (Max. FU speed) / 5.0 s

7 = (Max. FU speed) / 3.0 s

acceleration (r4)

Acceleration [m/s²]

Action Errors

831	Speed out of range
-----	--------------------

1.6.1.7 Action SetElevatorGrade

Sets a new grade value.

Syntax

Request: *A3s4d0*I0:*grade**Z

Response: *A3s4d0*Z

Parameters

grade (r4)

Final Grade [%]

Action Errors

832	Grade out of range
-----	--------------------

1.7 Service urn:schemas-coscom-org:serviceId:UserControl

This service instantiates a higher level control interface in contrast to the terminal or direct control interface. It models mainly the user control concept of the user terminal. For example one can start a specific test, which is implemented in the treadmill computer.

Syntax

```
Request: *D2s3d0*Z
Response: 0:X_ServiceIndex=3
          1:serviceType=urn:schemas-coscom-
            org:service:TreadmillUserControl:1
          2:serviceId=urn:schemas-coscom-org:serviceId:UserControl
          3:UTV=uuid:a0c23d32-46a8-44dd-b4cf-39aa430be4fe
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=IncSpeed
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=accelIndex
          2:direction=in
          5:dataType=uil
          0:X_ActionIndex=1
          1:name=DecSpeed
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=accelIndex
          2:direction=in
          5:dataType=uil
          0:X_ActionIndex=2
          1:name=HoldSpeed
          0:X_ActionIndex=3
          1:name=IncGrade
          0:X_ActionIndex=4
          1:name=DecGrade
          0:X_ActionIndex=5
          1:name=HoldGrade
          0:X_ActionIndex=6
          1:name=Pause
          0:X_ActionIndex=7
          1:name=Countdown
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=hrs
          2:direction=in
          5:dataType=uil
          0:X_ArgumentIndex=1
          1:name=min
          2:direction=in
          5:dataType=uil
          0:X_ArgumentIndex=2
          1:name=sec
          2:direction=in
          5:dataType=uil
          0:X_ArgumentIndex=3
          1:name=stopFlag
          2:direction=in
          5:dataType=boolean
```

```
0:X_ActionIndex=8
1:name=Cooldown
2:argumentList=
0:X_ArgumentIndex=0
1:name=speed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=1
1:name=grade
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=2
1:name=duration
2:direction=in
5:dataType=ui2
0:X_ActionIndex=9
1:name=Stop
0:X_ActionIndex=10
1:name=QuickStop
0:X_ActionIndex=11
1:name=ShowNextStep
2:argumentList=
0:X_ArgumentIndex=0
1:name=mode
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=speed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=2
1:name=grade
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=3
1:name=time
2:direction=in
5:dataType=ui1
0:X_ActionIndex=12
1:name=GetNextStepStatus
2:argumentList=
0:X_ArgumentIndex=0
1:name=mode
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=speed
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=2
1:name=grade
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=3
1:name=countdown
2:direction=out
5:dataType=ui1
0:X_ActionIndex=13
1:name=StartManual
0:X_ActionIndex=14
1:name=GetProfListSize
2:argumentList=
0:X_ArgumentIndex=0
```

```
1:name=size
2:direction=out
3:retval=
5:dataType=ui1
0:X_ActionIndex=15
1:name=GetProfListEntry
2:argumentList=
0:X_ArgumentIndex=0
1:name=index
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=number
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=intervalType
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=allowed
2:direction=out
5:dataType=boolean
0:X_ActionIndex=16
1:name=StartProfile
2:argumentList=
0:X_ArgumentIndex=0
1:name=number
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=scaleSpeed
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=scaleGrade
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=scaleInterval
2:direction=in
5:dataType=ui1
0:X_ActionIndex=17
1:name=ProfileStepBack
0:X_ActionIndex=18
1:name=ProfileStepForward
0:X_ActionIndex=19
1:name=SetProfileStepInterval
2:argumentList=
0:X_ArgumentIndex=0
1:name=intervalEnd
2:direction=in
5:dataType=ui2
0:X_ActionIndex=20
1:name=GetProfileStatus
2:argumentList=
0:X_ArgumentIndex=0
1:name=number
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=step
2:direction=out
```



```
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=speed
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=3
1:name=grade
2:direction=out
5:dataType=r4
0:X_ArgumentIndex=4
1:name=intervalType
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=5
1:name=intervalStart
2:direction=out
5:dataType=ui2
0:X_ArgumentIndex=6
1:name=intervalEnd
2:direction=out
5:dataType=ui2
0:X_ActionIndex=21
1:name=StartHeartRateControl
2:argumentList=
0:X_ArgumentIndex=0
1:name=maxSpeed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=1
1:name=maxHeartrate
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=minHeartrate
2:direction=in
5:dataType=ui1
0:X_ActionIndex=22
1:name=GetHRCStatus
2:argumentList=
0:X_ArgumentIndex=0
1:name=heartRate
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=controlState
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=minHeartRate
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=maxHeartRate
2:direction=out
5:dataType=ui1
0:X_ActionIndex=23
1:name=GetTestListSize
2:argumentList=
0:X_ArgumentIndex=0
1:name=size
2:direction=out
3:retval=
5:dataType=ui1
```

```
0:X_ActionIndex=24
1:name=GetTestListEntry
2:argumentList=
0:X_ArgumentIndex=0
1:name=index
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=1
1:name=name
2:direction=out
5:dataType=string
0:X_ArgumentIndex=2
1:name=number
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=3
1:name=testType
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=4
1:name=allowed
2:direction=out
5:dataType=boolean
0:X_ActionIndex=25
1:name=StartTestUKK
2:argumentList=
0:X_ArgumentIndex=0
1:name=sex
2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=age
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=weight
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=3
1:name=size
2:direction=in
5:dataType=uil
0:X_ActionIndex=26
1:name=GetUKKTestResult
2:argumentList=
0:X_ArgumentIndex=0
1:name=heartRate500
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=1
1:name=heartRate1000
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=2
1:name=heartRate1500
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=3
1:name=heartRate2000
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=4
1:name=heartRateAverage
```

```
2:direction=out
5:dataType=ui1
0:X_ArgumentIndex=5
1:name=time2000
2:direction=out
5:dataType=ui2
0:X_ArgumentIndex=6
1:name=index
2:direction=out
5:dataType=ui1
0:X_ActionIndex=27
1:name=StartTestStepper
2:argumentList=
0:X_ArgumentIndex=0
1:name=startSpeed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=1
1:name=intervalTime
2:direction=in
5:dataType=ui2
0:X_ArgumentIndex=2
1:name=speedIncrement
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=3
1:name=accelIndex
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=4
1:name=pauseTime
2:direction=in
5:dataType=ui2
0:X_ActionIndex=28
1:name=FreezeStepperTestPause
2:argumentList=
0:X_ArgumentIndex=0
1:name=frezed
2:direction=out
5:dataType=boolean
0:X_ActionIndex=29
1:name=StartNextStepperTestInterval
0:X_ActionIndex=30
1:name=StartTestConconi
2:argumentList=
0:X_ArgumentIndex=0
1:name=startSpeed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=1
1:name=interval
2:direction=in
5:dataType=ui2
0:X_ArgumentIndex=2
1:name=speedIncrement
2:direction=in
5:dataType=r4
0:X_ActionIndex=31
1:name=StartTestCooper
0:X_ActionIndex=32
1:name=TestCooperStepBack
0:X_ActionIndex=33
1:name=TestCooperStepForward
```

```
0:X_ActionIndex=34
1:name=StartTestRamp
2:argumentList=
0:X_ArgumentIndex=0
1:name=endSpeed
2:direction=in
5:dataType=r4
0:X_ArgumentIndex=1
1:name=interval
2:direction=in
5:dataType=uil
0:X_ActionIndex=35
1:name=StartTestGardner
0:X_ActionIndex=36
1:name=StartTestProfile
2:argumentList=
0:X_ArgumentIndex=0
1:name=number
2:direction=in
5:dataType=uil
0:X_ActionIndex=37
1:name=GetTestStatus
2:argumentList=
0:X_ArgumentIndex=0
1:name=name
2:direction=out
5:dataType=string
0:X_ArgumentIndex=1
1:name=number
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=2
1:name=testType
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=3
1:name=step
2:direction=out
5:dataType=uil
0:X_ActionIndex=38
1:name=GetPersonData
2:argumentList=
0:X_ArgumentIndex=0
1:name=sex
2:direction=out
5:dataType=char
0:X_ArgumentIndex=1
1:name=age
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=2
1:name=weight
2:direction=out
5:dataType=uil
0:X_ArgumentIndex=3
1:name=size
2:direction=out
5:dataType=uil
0:X_ActionIndex=39
1:name=SetPersonData
2:argumentList=
0:X_ArgumentIndex=0
1:name=sex
```

```

2:direction=in
5:dataType=char
0:X_ArgumentIndex=1
1:name=age
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=2
1:name=weight
2:direction=in
5:dataType=uil
0:X_ArgumentIndex=3
1:name=size
2:direction=in
5:dataType=uil
7:variableList=
0:X_VariableIndex=0
1:name=Mode
2:dataType=uil
4:flags=QE
0:X_VariableIndex=1
1:name=ControlStatus
2:dataType=uil
4:flags=QE
0:X_VariableIndex=2
1:name=NextStepCountdown
2:dataType=uil
4:flags=QE
0:X_VariableIndex=3
1:name=Step
2:dataType=uil
4:flags=QE
0:X_VariableIndex=4
1:name=HrcStatus
2:dataType=uil
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId: UserControl
ServiceIndex	3
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service: TreadmillUserControl: 1

Service Variables

Type	Name	Index	Flags	Description
ui1	ControlStatus	1	E Q	Control status: 0 = Stop 1 = Run 2 = Pause 8 = Graded test pause freezed 9 = Emergency stop

ui1	HrcStatus	4	E Q	Actual heart rate control status: 0 = idle 1 = heart rate too low - load is increased 2 = heart rate too high - load is decreased 3 = heart rate is okay 4 = failure
ui1	Mode	0	E Q	Actual user control mode: 1 = Select 2 = Manual 3 = Profile 4 = Cardio 5 = Test 6 = User Options 7 = Administrator Options
ui1	NextStepCountdown	2	E Q	Countdown time value [1/10 s] until next step starts
ui1	Step	3	E Q	Current step (1 ... 255), if a profile or test is processed

Service Methods

Name	Index	Description
Cooldown	8	Starts the cooldown phase. After the cooldown time (duration) the treadmill stops.
Countdown	7	Switches the time display mode from incrementing to decrementing (countdown). The time arguments set the time until the countdown expires. Then the treadmill optionally stops or the time increments again (starts with the the total time).
DecGrade	4	Decreases the treadmill grade.
DecSpeed	1	Decreases the treadmill speed (deceleration).
FreezeStepperTestPause	28	Freezes the pause of the stepper test (sets the pause time to infinite).
GetHRCStatus	22	Gets the actual status of the heart rate control.
GetNextStepStatus	12	Gets the status values of the next step. See action ShowNextStep.
GetPersonData	38	Gets all person data.
GetProfileStatus	20	Gets the actual profile status values.
GetProfListEntry	15	Gets a profile entry.
GetProfListSize	14	Gets number of stored profiles (profile list size). To get an entry use action GetProfileListEntry.
GetTestListEntry	24	Gets a test entry.
GetTestListSize	23	Gets number of implemented test (test list size). To get an entry use action GetTestListEntry.

GetTestStatus	37	Gets the actual test status, if a test is running.
GetUKKTestResult	26	Gets the UKK test result at the end of the test.
HoldGrade	5	Holds the actual grade (switches the elevator off).
HoldSpeed	2	Holds the actual speed (no acceleration or deceleration).
IncGrade	3	Increases the treadmill grade.
IncSpeed	0	Increases the treadmill speed (acceleration).
Pause	6	Same as DecSpeed. If the treadmill reaches the speed zero, the speed display shows "PAUS" and the incrementing of the run time is stopped until the treadmill accelerates again.
ProfileStepBack	17	Steps one profile step back, if a profile is currently running (profile mode or test mode with a test profile).
ProfileStepForward	18	Steps one profile step forward, if a profile is currently running (profile mode or test mode with a test profile).
QuickStop	10	Same as action "Stop", but with maximum deceleration.
SetPersonData	39	Sets all person data.
SetProfileStepInterval	19	Sets the interval end time or distance of the current profile step.
ShowNextStep	11	Shows next speed and/or grade values as long as the countdown runs or infinite. At the end of the countdown the actual speed and/or grade are not set. This have to be done with another action.
StartHeartRateControl	21	Starts heart rate control, which increases or decreases the speed and elevation to get the heart rate between the allowed range (minimum and maximum heart rate).
StartManual	13	Start manual mode.
StartNextStepperTestInterval	29	Starts next stepper test intervall (Finishes the pause interval).
StartProfile	16	Start a profile with scale parameters.
StartTestConconi	30	Starts the conconi test.
StartTestCooper	31	Starts the cooper test.
StartTestGardner	35	Starts the gardner test.
StartTestProfile	36	Starts a profile-based test.
StartTestRamp	34	Starts the ramp test.
StartTestStepper	27	Starts stepper test.
StartTestUKK	25	Starts the UKK Test.
Stop	9	Stops the treadmill and the actual mode. It's the same as pressing the key "Stop" at the user terminal.

TestCooperStepBack	32	Jumps one cooper test step back. Only valid if a cooper test is running.
TestCooperStepForward	33	Jumps one cooper test step forward. Only valid if a cooper test is running.

Service error codes

Error code	Error description
802	No cooldown possible
803	No manual mode possible
804	Invalid profile
805	No OEM profile
806	No profile mode possible
807	No cardio mode possible
808	No test mode possible
809	Invalid UKK test parameters
810	No UKK test active
811	No stepper test active
812	No cooper test active
813	Invalid test number
814	Invalid person parameter
815	Invalid nextstep mode
816	No profile started
817	HRC not started
818	Test not started
831	Speed out of range
832	Grade out of range

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.7.1 Actions

1.7.1.1 Action Cooldown

Starts the cooldown phase. After the cooldown time (duration) the treadmill stops.

Syntax

Request: *A8s3d0*I0:*speed**I1:*grade**I2:*duration**Z
Response: *A8s3d0*Z

Parameters

speed (r4)
Cooldown speed [m/s].

grade (r4)
Cooldown grade [%].

duration (ui2)
Cooldown duration [s].

Action Errors

832	Grade out of range
802	No cooldown possible
831	Speed out of range

1.7.1.2 Action Countdown

Switches the time display mode from incrementing to decrementing (countdown). The time arguments set the time until the countdown expires. Then the treadmill optionally stops or the time increments again (starts with the the total time).

Syntax

Request: *A7s3d0*I0:*hrs**I1:*min**I2:*sec**I3:*stopFlag**Z
Response: *A7s3d0*Z

Parameters

hrs (ui1)
Countdown hours

min (ui1)
Countdown minutes

sec (ui1)
Countdown seconds

stopFlag (boolean)
Flag to stop the treadmill, when the countdown is expired.

1.7.1.3 Action DecGrade

Decreases the treadmill grade.

Syntax

```
Request: *A4s3d0*Z
Response: *A4s3d0*Z
```

1.7.1.4 Action DecSpeed

Decreases the treadmill speed (deceleration).

Syntax

```
Request: *A1s3d0*I0:accelIndex*Z
Response: *A1s3d0*Z
```

Parameters

accelIndex (ui1)
Index (1 - 7) for a deceleration table with 7 values.
1 = lowest deceleration
...
7 = highest decelartion

1.7.1.5 Action FreezeStepperTestPause

Freezes the pause of the stepper test (sets the pause time to infinite).

Syntax

```
Request: *A28s3d0*Z
Response: *A28s3d0*00:freezed*Z
```

Parameters

freezed (boolean)

Action Errors

808	No test mode possible
-----	-----------------------

1.7.1.6 Action GetHRCStatus

Gets the actual status of the heart rate control.

Syntax

```
Request: *A22s3d0*Z
Response: *A22s3d0*00:heartRate*01:controlState*02:minHeartRate*03:
          maxHeartRate*Z
```

Parameters

heartRate (ui1)
Actual heart rate

controlState (ui1)

Actual heart rate control status:

- 0 = idle
- 1 = heart rate too low - load is increased
- 2 = heart rate too high - load is decreased
- 3 = heart rate is okay
- 4 = failure

minHeartRate (ui1)

Actual minimum heart rate

maxHeartRate (ui1)

Actual maximum heart rate

Action Errors

817	HRC not started
-----	-----------------

1.7.1.7 Action GetNextStepStatus

Gets the status values of the next step. See action ShowNextStep.

Syntax

Request: *A12s3d0*Z

Response: *A12s3d0*00:mode*01:speed*02:grade*03:countdown*Z

Parameters

mode (ui1)

- 0 = off
- 1 = display speed value
- 2 = display grade value
- 3 = display both values

speed (r4)

Speed value [m/s]

grade (r4)

Grade value [%]

countdown (ui1)

Display time in seconds.

- 0 = show next values infinite
- 1 - 25 = with countdown peeps and automatic clearing of the shown values

1.7.1.8 Action GetPersonData

Gets all person data.

Syntax

Request: *A38s3d0*Z

Response: *A38s3d0*00:sex*01:age*02:weight*03:size*Z

Parameters

sex (char)

Person sex:

'F' = female

'M' = male

age (ui1)

Person age [years]

weight (ui1)

Person weight [kg]

size (ui1)

Person size [cm]

1.7.1.9 Action GetProfileStatus

Gets the actual profile status values.

Syntax

Request: *A20s3d0*Z

Response: *A20s3d0*00:*number**01:*step**02:*speed**03:*grade**04:*intervalType**05:
*intervalStart**06:*intervalEnd**Z

Parameters

number (ui1)

Identification number of the profile

step (ui1)

Current step number (1 ... 255)

speed (r4)

Actual speed [m/s]

grade (r4)

Actual grade [%]

intervalType (ui1)

Interval type:

1 = time

2 = distance

intervalStart (ui2)

Interval start time [s] or distance [m]

intervalEnd (ui2)

Interval end time [s] or distance [m]

Action Errors

816	No profile started
-----	--------------------

1.7.1.10 Action GetProfListEntry

Gets a profile entry.

Syntax

```
Request: *A15s3d0*I0:index*Z
Response: *A15s3d0*01:number*02:intervalType*03:allowed*Z
```

Parameters

index (ui1)

Profile list index (0 to GetProfileListSize() - 1)

number (ui1)

Displayed (identification) number

intervalType (ui1)

Profile interval type:

0 = time and distance steps

1 = time steps

2 = distance steps

allowed (boolean)

True, if this profile can be started

False, if this profile is not allowed by the actual treadmill configuration

1.7.1.11 Action GetProfListSize

Gets number of stored profiles (profile list size). To get an entry use action GetProfileListEntry.

Syntax

```
Request: *A14s3d0*Z
Response: *A14s3d0*00:size*Z
```

Parameters

size (ui1)

Number of stored profiles

1.7.1.12 Action GetTestListEntry

Gets a test entry.

Syntax

```
Request: *A24s3d0*I0:index*Z
Response: *A24s3d0*01:name*02:number*03:testType*04:allowed*Z
```

Parameters

index (ui1)

Test list index (0 to GetTestListSize() - 1)

name (string)

Test name

number (ui1)

Displayed (identification) number

testType (ui1)

Test type:

1 = complex

2 = factory profile

3 = user profile

allowed (boolean)

True, if this test can be started

False, if this test is not allowed by the actual treadmill configuration

1.7.1.13 Action GetTestListSize

Gets number of implemented test (test list size). To get an entry use action GetTestListEntry.

Syntax

Request: *A23s3d0*Z

Response: *A23s3d0*00: *size**Z

Parameters

size (ui1)

Number of implemented tests

1.7.1.14 Action GetTestStatus

Gets the actual test status, if a test is running.

Syntax

Request: *A37s3d0*Z

Response: *A37s3d0*00: *name**01: *number**02: *testType**03: *step**Z

Parameters

name (string)

Test name

number (ui1)

Test identification number

testType (ui1)

Test type:

1 = Complex

2 = Profile

3 = User Profile

step (ui1)

Current step number (1 ... 255)

Action Errors

818	Test not started
-----	------------------

1.7.1.15 Action GetUKKTestResult

Gets the UKK test result at the end of the test.

Syntax

```
Request: *A26s3d0*Z
Response: *A26s3d0*00:heartRate500*01:heartRate1000*02:heartRate1500*03:
          heartRate2000*04:heartRateAverage*05:time2000*06:index*Z
```

Parameters

heartRate500 (ui1)
Heart Rate at 500 meters

heartRate1000 (ui1)
Heart Rate at 1000 meters

heartRate1500 (ui1)
Heart Rate at 1500 meters

heartRate2000 (ui1)
Heart Rate at 2000 meters

heartRateAverage (ui1)
Heart rate average

time2000 (ui2)
Time [s] for test length of 2000 meters

index (ui1)
UKK test index
Interpretation of the index:
< 70: Considerably below average fitness
70 - 89: Slightly below average fitness
90 - 110: Average fitness
111 - 130: Slightly above average fitness
> 130: Considerably above average fitness

Action Errors

810	No UKK test active
-----	--------------------

1.7.1.16 Action HoldGrade

Holds the actual grade (switches the elevator off).

Syntax

```
Request: *A5s3d0*Z
Response: *A5s3d0*Z
```

1.7.1.17 Action HoldSpeed

Holds the actual speed (no acceleration or deceleration).

Syntax

Request: *A2s3d0*Z
Response: *A2s3d0*Z

1.7.1.18 Action IncGrade

Increases the treadmill grade.

Syntax

Request: *A3s3d0*Z
Response: *A3s3d0*Z

1.7.1.19 Action IncSpeed

Increases the treadmill speed (acceleration).

Syntax

Request: *A0s3d0*I0:*accelIndex**Z
Response: *A0s3d0*Z

Parameters

accelIndex (ui1)

Index (1 - 7) for an acceleration table with 7 values.

1 = lowest acceleration

...

7 = highest acceleration

1.7.1.20 Action Pause

Same as DecSpeed. If the treadmill reaches the speed zero, the speed display shows "PAUS" and the incrementing of the run time is stopped until the treadmill accelerates again.

Syntax

Request: *A6s3d0*Z
Response: *A6s3d0*Z

1.7.1.21 Action ProfileStepBack

Steps one profile step back, if a profile is currently running (profile mode or test mode with a test profile).

Syntax

Request: *A17s3d0*Z
Response: *A17s3d0*Z

Action Errors

806	No profile mode possible
-----	--------------------------

1.7.1.22 Action ProfileStepForward

Steps one profile step forward, if a profile is currently running (profile mode or test mode with a test profile).

Syntax

Request: *A18s3d0*Z
Response: *A18s3d0*Z

Action Errors

806	No profile mode possible
-----	--------------------------

1.7.1.23 Action QuickStop

Same as action "Stop", but with maximum deceleration.

Syntax

Request: *A10s3d0*Z
Response: *A10s3d0*Z

1.7.1.24 Action SetPersonData

Sets all person data.

Syntax

Request: *A39s3d0*I0:sex*I1:age*I2:weight*I3:size*Z
Response: *A39s3d0*Z

Parameters

sex (char)

Person sex:
'F' = female
'M' = male

age (ui1)

Person age [years]

weight (ui1)
Person weight [kg]

size (ui1)
Person size [cm]

Action Errors

814	Invalid person parameter
-----	--------------------------

1.7.1.25 Action SetProfileStepInterval

Sets the interval end time or distance of the current profile step.

Syntax

Request: `*A19s3d0*I0:intervalEnd*Z`
Response: `*A19s3d0*Z`

Parameters

intervalEnd (ui2)
Interval end time [s] or distance [m]

Action Errors

816	No profile started
-----	--------------------

1.7.1.26 Action ShowNextStep

Shows next speed and/or grade values as long as the countdown runs or infinite. At the end of the countdown the actual speed and/or grade are not set. This have to be done with another action.

Syntax

Request: `*A11s3d0*I0:mode*I1:speed*I2:grade*I3:time*Z`
Response: `*A11s3d0*Z`

Parameters

mode (ui1)
The mode determines which values are shown:
0 = off (no argument values are shown and a running countdown is canceled)
1 = display speed value
2 = display grade value
3 = display both values

speed (r4)
Speed value [m/s]

grade (r4)
Grade value [%]

time (ui1)
Display time in seconds.

0 = show next values infinite

1 - 25 = with countdown peeps and automatic clearing of the shown values

Action Errors

815	Invalid nextstep mode
-----	-----------------------

1.7.1.27 Action StartHeartRateControl

Starts heart rate control, which increases or decreases the speed and elevation to get the heart rate between the allowed range (minimum and maximum heart rate).

Syntax

Request: *A21s3d0*I0:maxSpeed*I1:maxHeartrate*I2:minHeartrate*Z

Response: *A21s3d0*Z

Parameters

maxSpeed (r4)

Maximum speed to get a higher heart rate. If this speed value isn't sufficient for the heart rate control, then the grade is increased.

maxHeartrate (ui1)

Maximum heart rate

minHeartrate (ui1)

Minimum heart rate

Action Errors

831	Speed out of range
807	No cardio mode possible

1.7.1.28 Action StartManual

Start manual mode.

Syntax

Request: *A13s3d0*Z

Response: *A13s3d0*Z

Action Errors

803	No manual mode possible
-----	-------------------------

1.7.1.29 Action StartNextStepperTestInterval

Starts next stepper test intervall (Finishes the pause interval).

Syntax

Request: *A29s3d0*Z

Response: *A29s3d0*Z

Action Errors

811	No stepper test active
-----	------------------------

1.7.1.30 Action StartProfile

Start a profile with scale parameters.

Syntax

Request: *A16s3d0*I0:number*I1:scaleSpeed*I2:scaleGrade*I3:scaleInterval*Z
Response: *A16s3d0*Z

Parameters

number (ui1)

Profile identification (displayed) number

scaleSpeed (ui1)

Speed scale parameter. Allowd values:

60 = 60 %

80 = 80 %

100 = 100 %

120 = 120 %

140 = 140 %

160 = 160 %

scaleGrade (ui1)

Grade scale parameter. Allowd values:

60 = 60 %

80 = 80 %

100 = 100 %

120 = 120 %

140 = 140 %

160 = 160 %

scaleInterval (ui1)

Interval scale parameter. Allowd values:

60 = 60 %

80 = 80 %

100 = 100 %

120 = 120 %

140 = 140 %

160 = 160 %

Action Errors

804	Invalid profile
806	No profile mode possible
805	No OEM profile

1.7.1.31 Action StartTestConconi

Starts the conconi test.

Syntax

Request: *A30s3d0*I0:startSpeed*I1:interval*I2:speedIncrement*Z
Response: *A30s3d0*Z

Parameters

startSpeed (r4)
Start speed [m/s]

interval (ui2)
Interval distance [m] of test steps

speedIncrement (r4)
Speed increment [m/s] between the test steps

Action Errors

808	No test mode possible
831	Speed out of range

1.7.1.32 Action StartTestCooper

Starts the cooper test.

Syntax

Request: *A31s3d0*Z
Response: *A31s3d0*Z

Action Errors

808	No test mode possible
-----	-----------------------

1.7.1.33 Action StartTestGardner

Starts the gardner test.

Syntax

Request: *A35s3d0*Z
Response: *A35s3d0*Z

Action Errors

808	No test mode possible
-----	-----------------------

1.7.1.34 Action StartTestProfile

Starts a profile-based test.

Syntax

Request: *A36s3d0*I0:number*Z
Response: *A36s3d0*Z

Parameters

number (ui1)

Test identification number

Action Errors

808	No test mode possible
813	Invalid test number

1.7.1.35 Action StartTestRamp

Starts the ramp test.

Syntax

Request: *A34s3d0*I0:endSpeed*I1:interval*Z

Response: *A34s3d0*Z

Parameters

endSpeed (r4)

End speed [m/s]

interval (ui1)

Interval time [s]

Action Errors

808	No test mode possible
831	Speed out of range

1.7.1.36 Action StartTestStepper

Starts stepper test.

Syntax

Request: *A27s3d0*I0:startSpeed*I1:intervalTime*I2:speedIncrement*I3:
accelIndex*I4:pauseTime*Z

Response: *A27s3d0*Z

Parameters

startSpeed (r4)

Start speed [m/s]

intervalTime (ui2)

Interval time [s]

speedIncrement (r4)

Speed increment [m/s]

accelIndex (ui1)

Acceleration/Deceleration index (1 to 7)

pauseTime (ui2)

Pause time [s]

Action Errors

808	No test mode possible
831	Speed out of range

1.7.1.37 Action StartTestUKK

Starts the UKK Test.

Syntax

Request: `*A25s3d0*I0:sex*I1:age*I2:weight*I3:size*Z`
Response: `*A25s3d0*Z`

Parameters

sex (char)
Sex of the running person:
'F' = female
'M' = male

age (ui1)
Person age [years]

weight (ui1)
Person weight [kg]

size (ui1)
Person size [cm]

Action Errors

808	No test mode possible
809	Invalid UKK test parameters

1.7.1.38 Action Stop

Stops the treadmill and the actual mode. It's the same as pressing the key "Stop" at the user terminal.

Syntax

Request: `*A9s3d0*Z`
Response: `*A9s3d0*Z`

1.7.1.39 Action TestCooperStepBack

Jumps one cooper test step back. Only valid if a cooper test is running.

Syntax

Request: `*A32s3d0*Z`
Response: `*A32s3d0*Z`

Action Errors

812	No cooper test active
-----	-----------------------

1.7.1.40 Action TestCooperStepForward

Jumps one cooper test step forward. Only valid if a cooper test is running.

Syntax

Request: *A33s3d0*Z

Response: *A33s3d0*Z

Action Errors

812	No cooper test active
-----	-----------------------

1.8 Service urn:schemas-coscom-org:serviceId:Measures

Treadmill measures like speed, grade, time, distance, mets, heart rate, ...

Syntax

Request: *D2s2d0*Z

Response: 0:X_ServiceIndex=2
1:serviceType=urn:schemas-coscom-org:service:TreadmillMeasures:1
2:serviceId=urn:schemas-coscom-org:serviceId:Measures
3:UTV=uuid:01a81afd-1f3a-4027-8b86-83f871daalce
4:majorVersion=1
5:minorVersion=1
6:actionList=
0:X_ActionIndex=0
1:name=SetEventMask
2:argumentList=
0:X_ArgumentIndex=0
1:name=eventMask
2:direction=in
5:dataType=bin.hex
0:X_ActionIndex=1
1:name=ResetTime
0:X_ActionIndex=2
1:name=SetTime
2:argumentList=
0:X_ArgumentIndex=0
1:name=hrs
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=min
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=sec
2:direction=in
5:dataType=ui1
0:X_ActionIndex=3
1:name=ResetDistance
0:X_ActionIndex=4
1:name=SetDistance
2:argumentList=
0:X_ArgumentIndex=0
1:name=distance
2:direction=in
5:dataType=r4
0:X_ActionIndex=5
1:name=ResetEnergy
7:variableList=
0:X_VariableIndex=0
1:name=Time
2:dataType=ui4
4:flags=QE
0:X_VariableIndex=1
1:name=Distance
2:dataType=r4
4:flags=QE
0:X_VariableIndex=2
1:name=Speed
2:dataType=r4
4:flags=QE

```

0:X_VariableIndex=3
1:name=Grade
2:dataType=r4
4:flags=QE
0:X_VariableIndex=4
1:name=HeartRate
2:dataType=ui1
4:flags=QE
0:X_VariableIndex=5
1:name=Power
2:dataType=r4
4:flags=QE
0:X_VariableIndex=6
1:name=Energy
2:dataType=r4
4:flags=QE
0:X_VariableIndex=7
1:name=MET
2:dataType=r4
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:Measures
ServiceIndex	2
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TreadmillMeasures:1

Service Variables

Type	Name	Index	Flags	Description
r4	Distance	1	E Q	Actual distance value [m].
r4	Energy	6	E Q	Actual energy value [kJ].
r4	Grade	3	E Q	Actual grade value [%].
ui1	HeartRate	4	E Q	Actual heart rate [1/min].
r4	MET	7	E Q	Actual MET (metabolic equivalent) value.
r4	Power	5	E Q	Actual power value [W].
r4	Speed	2	E Q	Actual speed value [m/s].
ui4	Time	0	E Q	Actual run time value [s].

Service Methods

Name	Index	Description
ResetDistance	3	Resets the distance value.
ResetEnergy	5	Resets the energy value.
ResetTime	1	Resets the run time.
SetDistance	4	Sets the distance value.
SetEventMask	0	Sets the event mask to control the eventing of each measure.
SetTime	2	Sets the time values.

Service error codes

Error code	Error description
830	Distance value too big

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.8.1 Actions

1.8.1.1 Action ResetDistance

Resets the distance value.

Syntax

Request: *A3s2d0*Z
Response: *A3s2d0*Z

1.8.1.2 Action ResetEnergy

Resets the energy value.

Syntax

Request: *A5s2d0*Z
Response: *A5s2d0*Z

1.8.1.3 Action ResetTime

Resets the run time.

Syntax

Request: *A1s2d0*Z
Response: *A1s2d0*Z

1.8.1.4 Action SetDistance

Sets the distance value.

Syntax

Request: *A4s2d0*I0:*distance**Z
Response: *A4s2d0*Z

Parameters

distance (r4)

The resolution of the distance value is 0.1 m and the maximum value depends on the treadmill type.

e.g. type 1.3 (167400 increments / m): 0 - 256569 m

Action Errors

830	Distance value too big
-----	------------------------

1.8.1.5 Action SetEventMask

Sets the event mask to control the eventing of each measure.

Syntax

```
Request: *A0s2d0*I0:eventMask*Z  
Response: *A0s2d0*Z
```

Parameters

eventMask (bin.hex)

Event Mask: time 0x01, distance 0x02, speed: 0x04, grade 0x08, heart rate 0x10, power 0x20, energy 0x40, MET 0x80

1.8.1.6 Action SetTime

Sets the time values.

Syntax

```
Request: *A2s2d0*I0:hrs*I1:min*I2:sec*Z  
Response: *A2s2d0*Z
```

Parameters

hrs (ui1)

Hours value from 0 to 255

min (ui1)

Minutes value:

hrs = 0: 0 - 59 minutes or 0 - 99 minutes

hrs > 0: 0 - 59 minutes

sec (ui1)

Seconds value from 0 to 59

1.9 Service urn:schemas-coscom-org:serviceId:Terminal

This is a service to build a remote terminal with the same display and keyboard layout as the built-in treadmill terminal.

Syntax

```
Request: *D2s1d0*Z
Response: 0:X_ServiceIndex=1
          1:serviceType=urn:schemas-coscom-org:service:TerminalLCD6x4Panel:1

          2:serviceId=urn:schemas-coscom-org:serviceId:Terminal
          3:UTV=uuid:0e0a3b9a-6375-4bbd-9867-78290dba78dd
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=KeyDown
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=key
          2:direction=in
          5:dataType=char
          0:X_ActionIndex=1
          1:name=KeyUp
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=key
          2:direction=in
          5:dataType=char
          0:X_ActionIndex=2
          1:name=GetKeyLock
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=lock
          2:direction=out
          5:dataType=boolean
          0:X_ActionIndex=3
          1:name=SetKeyLock
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=lock
          2:direction=in
          5:dataType=boolean
          0:X_ActionIndex=4
          1:name=Beep
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=duration
          2:direction=in
          5:dataType=uil
          0:X_ActionIndex=5
          1:name=SetModeLED
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=mode
          2:direction=in
          5:dataType=uil
          0:X_ArgumentIndex=1
          1:name=blink
          2:direction=in
          5:dataType=boolean
```

```
0:X_ActionIndex=6
1:name=GetSpeedUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=out
3:retval=
5:dataType=uil
0:X_ActionIndex=7
1:name=SetSpeedUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=in
5:dataType=uil
0:X_ActionIndex=8
1:name=GetDistanceUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=out
3:retval=
5:dataType=uil
0:X_ActionIndex=9
1:name=SetDistanceUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=in
5:dataType=uil
0:X_ActionIndex=10
1:name=GetGradeUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=out
3:retval=
5:dataType=uil
0:X_ActionIndex=11
1:name=SetGradeUnit
2:argumentList=
0:X_ArgumentIndex=0
1:name=unit
2:direction=in
5:dataType=uil
7:variableList=
0:X_VariableIndex=0
1:name=ULDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=1
1:name=UMDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=2
1:name=URDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=3
1:name=LLDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=4
```

```

1:name=LMDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=5
1:name=LRDisplay
2:dataType=string
4:flags=QE
0:X_VariableIndex=6
1:name=LEDGroups
2:dataType=bin.hex
4:flags=QE
0:X_VariableIndex=7
1:name=BuzzerTime
2:dataType=ui1
4:flags=QE
0:X_VariableIndex=8
1:name=BlinkState
2:dataType=boolean
4:flags=QE
0:X_VariableIndex=9
1:name=KeyState
2:dataType=bin.hex
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:Terminal
ServiceIndex	1
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:TerminalLCD6x4Panel:1

Service Variables

Type	Name	Index	Flags	Description
boolean	BlinkState	8	E Q	Blink state of all LCD displays and LEDs. Every change sends an event. 0 = Off, 1 = On
ui1	BuzzerTime	7	E Q	Current remaining buzzer on time in 1/100 seconds. The change events are sent as often as possible.

bin.hex	KeyState	9	E Q	<p>Bit field with MCU 4 key states (key on = bit set, key off = bit cleared).</p> <p>Key bit masks:</p> <p>0x01 = STOP</p> <p>0x02 = START</p> <p>0x04 = UP</p> <p>0x08 = DOWN</p> <p>0x10 = PLUS</p> <p>0x20 = MINUS</p> <p>0x80 = EMERGENCY STOP</p> <p>Each state change sends an event, if the change rate isn't too high.</p>
bin.hex	LEDGroups	6	E Q	<p>9 hex digits with the LED index of a LED group.</p> <p>Indexes of LED groups:</p> <p>first digit:</p> <p>5 = manual</p> <p>4 = profile</p> <p>3 = cardio</p> <p>2 = test</p> <p>2. digit</p> <p>5 = max</p> <p>3. digit</p> <p>1 = mph</p> <p>2 = m/s</p> <p>3 = km/h</p> <p>4 = m/min</p> <p>4. digit</p> <p>3 = miles</p> <p>4 = km</p> <p>5 = m</p> <p>5. digit</p> <p>4 = <°</p> <p>5 = %</p> <p>6. digit</p> <p>1 = No.</p> <p>2 = Step</p> <p>7. digit</p> <p>1 = power</p> <p>2 = energy</p> <p>5 = met</p> <p>8. digit</p> <p>4 = v min.</p> <p>5 = ^ max.</p> <p>9. digit</p> <p>1 = weight</p> <p>2 = age</p> <p>3 = sex</p> <p>index + A = blinking</p> <p>0 = all off</p> <p>Each change sends an event.</p>

string	LLDisplay	3	E Q	<p>Lower left LCD display string and attributes:</p> <ul style="list-style-type: none"> - the first 4 characters build the display string - the fifth character (hexdecimal) describes the bit field for blinking digits - the sixth character (hexdecimal) describes the bit field for points between the digits - the seventh character (hexdecimal) describes the bit field for blinking points <p>Bit pattern for blinking display digits (character 5 in the message string)</p> <p>0x0 No blinking digits 0x1 Left digit is blinking 0x2 Middle left digit is blinking 0x4 Middle right digit is blinking 0x8 Right digit is blinking</p> <p>Bit pattern for display points (character 6 in the message string)</p> <p>0x0 No points 0x1 Left point 0x2 Middle point 0x4 Right point 0x8 Colon</p> <p>Bit pattern for blinking display points (character 7 in the message string)</p> <p>0x0 No blinking points 0x1 Blinking left point 0x2 Blinking middle point 0x4 Blinking right point 0x8 Blinking colon</p> <p>Example: " 00040" shows the string " 00" with a right point and looks like " 0.0"</p> <p>Each state change sends an event, if the change rate isn't too high.</p>
string	LMDisplay	4	E Q	Lower middle LCD display string and attributes. Same format as LLDisplay.
string	LRDisplay	5	E Q	Lower right LCD display string and attributes. Same format as LLDisplay.
string	ULDisplay	0	E Q	Upper left LCD display string and attributes. Same format as LLDisplay.

string	UMDisplay	1	E Q	Upper middle LCD display string and attributes. Same format as LLDisplay.
string	URDisplay	2	E Q	Upper right LCD display string and attributes. Same format as LLDisplay.

Service Methods

Name	Index	Description
Beep	4	Switches the buzzer of the treadmill terminal on. The beep lasts as long as the given duration argument.
GetDistanceUnit	8	Gets the configured distance unit.
GetGradeUnit	10	Gets the configured grade unit.
GetKeyLock	2	Gets the keyboard lock state. If locked, only the key "-" and "Stop" can be used. Both stop the treadmill.
GetSpeedUnit	6	Gets the configured speed unit.
KeyDown	0	Changes the key state to "key down" (key pressed).
KeyUp	1	Changes the key state to "key up" (key released).
SetDistanceUnit	9	Sets the distance unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.
SetGradeUnit	11	Sets the grade unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.
SetKeyLock	3	Sets the keyboard lock state. If locked, only the key "-" and "Stop" can be used. Both stop the treadmill.
SetModeLED	5	Sets one of the mode LEDs or switches all off. The current control mode isn't be influenced.
SetSpeedUnit	7	Sets the speed unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.

Service error codes

Error code	Error description
819	Invalid LED mode
820	Invalid unit

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.9.1 Actions

1.9.1.1 Action Beep

Switches the buzzer of the treadmill terminal on. The beep lasts as long as the given duration argument.

Syntax

```
Request: *A4s1d0*I0:duration*Z  
Response: *A4s1d0*Z
```

Parameters

duration (ui1)

Beep time in 1/100 seconds (0 to 2.55 s).

1.9.1.2 Action GetDistanceUnit

Gets the configured distance unit.

Syntax

```
Request: *A8s1d0*Z  
Response: *A8s1d0*00:unit*Z
```

Parameters

unit (ui1)

0 = km, 1 = miles, 2 = m

1.9.1.3 Action GetGradeUnit

Gets the configured grade unit.

Syntax

```
Request: *A10s1d0*Z  
Response: *A10s1d0*00:unit*Z
```

Parameters

unit (ui1)

0 = %, 1 = ° (degree)

1.9.1.4 Action GetKeyLock

Gets the keyboard lock state. If locked, only the key "-" and "Stop" can be used. Both stop the treadmill.

Syntax

```
Request: *A2s1d0*Z  
Response: *A2s1d0*00:lock*Z
```

Parameters

lock (boolean)

0 = unlocked, 1 = locked

1.9.1.5 Action GetSpeedUnit

Gets the configured speed unit.

Syntax

Request: **A6s1d0*Z*

Response: **A6s1d0*00:unit*Z*

Parameters

unit (ui1)

0 = km/h, 1 = m/s, 2 = mph, 3 = m/min

1.9.1.6 Action KeyDown

Changes the key state to "key down" (key pressed).

Syntax

Request: **A0s1d0*I0:key*Z*

Response: **A0s1d0*Z*

Parameters

key (char)

+ = Minus, - = Plus, U = Up, D = Down, E = Start, S = Stop, F = Emergency Stop

1.9.1.7 Action KeyUp

Changes the key state to "key up" (key released).

Syntax

Request: **A1s1d0*I0:key*Z*

Response: **A1s1d0*Z*

Parameters

key (char)

+ = Minus, - = Plus, U = Up, D = Down, E = Start, S = Stop, F = Emergency Stop

1.9.1.8 Action SetDistanceUnit

Sets the distance unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.

Syntax

```
Request: *A9s1d0*I0:unit*Z
Response: *A9s1d0*Z
```

Parameters

unit (ui1)
0 = km, 1 = miles, 2 = m

Action Errors

820	Invalid unit
-----	--------------

1.9.1.9 Action SetGradeUnit

Sets the grade unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.

Syntax

```
Request: *A11s1d0*I0:unit*Z
Response: *A11s1d0*Z
```

Parameters

unit (ui1)
0 = %, 1 = ° (degree)

Action Errors

820	Invalid unit
-----	--------------

1.9.1.10 Action SetKeyLock

Sets the keyboard lock state. If locked, only the key "-" and "Stop" can be used. Both stop the treadmill.

Syntax

```
Request: *A3s1d0*I0:lock*Z
Response: *A3s1d0*Z
```

Parameters

lock (boolean)
0 = unlocked, 1 = locked

1.9.1.11 Action SetModeLED

Sets one of the mode LEDs or switches all off. The current control mode isn't be influenced.

Syntax

```
Request: *A5s1d0*I0:mode*I1:blink*Z
Response: *A5s1d0*Z
```

Parameters

mode (ui1)

0 = All Off, 1 = Manual, 2 = Profile, 3 = Cardio, 4 = Test

blink (boolean)

0 = permanent on, 1 = blinking

Action Errors

819	Invalid LED mode
-----	------------------

1.9.1.12 Action SetSpeedUnit

Sets the speed unit temporarily. If the treadmill is switched off or if the configuration mode is entered, then this setting is lost.

Syntax

Request: *A7s1d0*I0:*unit**Z

Response: *A7s1d0*Z

Parameters

unit (ui1)

0 = km/h, 1 = m/s, 2 = mph, 3 = m/min

Action Errors

820	Invalid unit
-----	--------------

1.10 Service urn:schemas-coscom-org:serviceId:MCU5FlashUpdate

This service can be used to update the firmware in the flash of the microcontroller. The update is separated in two phases. First a data buffer (data flash on the electronic board) is written with the firmware and constant data (WriteBuffer). In the second phase the microcontroller reads from the data flash part and writes to its on-chip flash memory (StartUpdate) without any intervention from the client. After a successful update of the on-chip flash, the microcontroller resets automatically.

Syntax

```
Request: *D2s9d0*Z
Response: 0:X_ServiceIndex=9
          1:serviceType=urn:schemas-coscom-org:service:MCU5FlashUpdate:1
          2:serviceId=urn:schemas-coscom-org:serviceId:MCU5FlashUpdate
          3:UTV=uuid:3a50dbfe-3377-11dc-8314-0800200c9a66
          4:majorVersion=1
          5:minorVersion=1
          6:actionList=
          0:X_ActionIndex=0
          1:name=GetFirmwareVersion
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=version
          2:direction=out
          5:dataType=string
          0:X_ActionIndex=1
          1:name=GetDefaultType
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=type
          2:direction=out
          5:dataType=ui1
          0:X_ArgumentIndex=1
          1:name=subType
          2:direction=out
          5:dataType=ui1
          0:X_ActionIndex=2
          1:name=ShowUpdateScreen
          0:X_ActionIndex=3
          1:name=WriteBuffer
          2:argumentList=
          0:X_ArgumentIndex=0
          1:name=page128Idx
          2:direction=in
          5:dataType=ui2
          0:X_ArgumentIndex=1
          1:name=packet
          2:direction=in
          5:dataType=bin.base64
          0:X_ArgumentIndex=2
          1:name=key1
          2:direction=in
          5:dataType=ui1
          0:X_ArgumentIndex=3
          1:name=key2
          2:direction=in
          5:dataType=ui1
          0:X_ArgumentIndex=4
          1:name=error
          2:direction=out
          5:dataType=ui1
```



```

0:X_ActionIndex=4
1:name=ReadBuffer
2:argumentList=
0:X_ArgumentIndex=0
1:name=page128Idx
2:direction=in
5:dataType=ui2
0:X_ArgumentIndex=1
1:name=key1
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=2
1:name=key2
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=3
1:name=packet
2:direction=out
5:dataType=bin.base64
0:X_ActionIndex=5
1:name=StartUpdate
2:argumentList=
0:X_ArgumentIndex=0
1:name=key1
2:direction=in
5:dataType=ui1
0:X_ArgumentIndex=1
1:name=key2
2:direction=in
5:dataType=ui1
0:X_ActionIndex=6
1:name=SoftReset
7:variableList=
0:X_VariableIndex=0
1:name=UpdatePageCountdown
2:dataType=ui2
3:defaultValue=0
4:flags=QE

```

Service Properties

Property name	Value
ServiceId	urn:schemas-coscom-org:serviceId:MCU5FlashUpdate
ServiceIndex	9
MajorVersion	1
MinorVersion	1
ServiceType	urn:schemas-coscom-org:service:MCU5FlashUpdate: 1

Service Variables

Type	Name	Index	Flags	Description
ui2	UpdatePageCountdown	0	E Q	

Service Methods

Name	Index	Description
------	-------	-------------

GetDefaultType	1	Gets the default type and sub type, which has been set by the factory. This values are important, if the configuration parameters (options) of the treadmill are lost (e.g. the battery of the Real-Time-Clock has been replaced or the signature of the configuration memory is false).
GetFirmwareVersion	0	Gets the firmware version.
ReadBuffer	4	Reads 128 bytes of the data flash buffer. The data flash buffer has a size of 256 bytes. An even page index reads the lower 128 bytes of data flash buffer and an odd page index reads the upper 128 bytes of the data flash buffer. Any call to ReadBuffer loads the data flash buffer from the data flash first. The data flash has a size of 256 kByte (= 2048 * 128).
ShowUpdateScreen	2	Shows flash update strings on the displays. This action should be used before the action "StartUpdate" is called.
SoftReset	6	After the response of this action is sent, the microcontroller jumps to the reset address (soft reset).
StartUpdate	5	Starts the flash update of the microcontroller built-in flash.
WriteBuffer	3	Writes 128 bytes to the data flash buffer. The data flash buffer has a size of 256 bytes. If the second 128 Bytes (odd page index) of the buffer are written, then the whole buffer is written to the data flash. The data flash has a size of 256 kByte (= 2048 * 128).

Service error codes

No error codes defined

Details

On the following pages you will find a detailed description for every action and variable of this service.

1.10.1 Actions

1.10.1.1 Action GetDefaultType

Gets the default type and sub type, which has been set by the factory. This values are important, if the configuration parameters (options) of the treadmill are lost (e.g. the battery of the Real-Time-Clock has been replaced or the signature of the configuration memory is false).

Syntax

```
Request: *A1s9d0*Z  
Response: *A1s9d0*00:type*01:subType*Z
```

Parameters

type (ui1)
Major type (major treadmill type)

subType (ui1)
Sub type (treadmill type variant)

1.10.1.2 Action GetFirmwareVersion

Gets the firmware version.

Syntax

```
Request: *A0s9d0*Z  
Response: *A0s9d0*00:version*Z
```

Parameters

version (string)
String with 4 digits (e.g. 4011)

1.10.1.3 Action ReadBuffer

Reads 128 bytes of the data flash buffer. The data flash buffer has a size of 256 bytes. An even page index reads the lower 128 bytes of data flash buffer and an odd page index reads the upper 128 bytes of the data flash buffer. Any call to ReadBuffer loads the data flash buffer from the data flash first. The data flash has a size of 256 kByte (= 2048 * 128).

Syntax

```
Request: *A4s9d0*I0:page128Idx*I1:key1*I2:key2*Z  
Response: *A4s9d0*03:packet*Z
```

Parameters

page128Idx (ui2)
Index of the 128 byte long page:
0 <= page128Idx < 2048

key1 (ui1)

Access key 1

key2 (ui1)
Access key 2

packet (bin.base64)
Flash memory packet:
128 flash buffer bytes + 1 checksum byte = 129 bytes
129 bytes base64 coded = 172 characters
 $(129 / 3) * 4 = 172$

1.10.1.4 Action ShowUpdateScreen

Shows flash update strings on the displays. This action should be used before the action "StartUpdate" is called.

Syntax

Request: *A2s9d0*Z
Response: *A2s9d0*Z

1.10.1.5 Action SoftReset

After the response of this action is sent, the microcontroller jumps to the reset address (soft reset).

Syntax

Request: *A6s9d0*Z
Response: *A6s9d0*Z

1.10.1.6 Action StartUpdate

Starts the flash update of the microcontroller built-in flash.

Syntax

Request: *A5s9d0*I0:*key1**I1:*key2**Z
Response: *A5s9d0*Z

Parameters

key1 (ui1)
Access key 1

key2 (ui1)
Access key 2

1.10.1.7 Action WriteBuffer

Writes 128 bytes to the data flash buffer. The data flash buffer has a size of 256 bytes. If

the second 128 Bytes (odd page index) of the buffer are written, then the whole buffer is written to the data flash. The data flash has a size of 256 kByte (= 2048 * 128).

Syntax

```
Request: *A3s9d0*I0:page128Idx*I1:packet*I2:key1*I3:key2*Z  
Response: *A3s9d0*O4:error*Z
```

Parameters

page128Idx (ui2)

Index of the 128 byte long page:
 $0 \leq \text{page128Idx} < 2048$

packet (bin.base64)

Flash update packet:
128 flash buffer bytes + 1 checksum byte = 129 bytes
129 bytes base64 coded = 172 characters
 $(129 / 3) * 4 = 172$

key1 (ui1)

Access key 1

key2 (ui1)

Access key 2

error (ui1)

Packet checksum error:
0 = okay
1 = wrong