

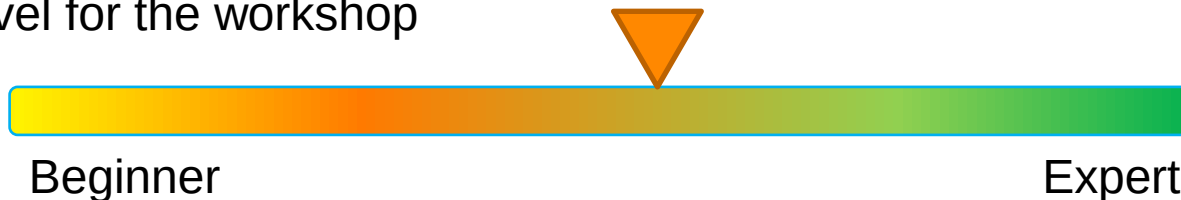


# Sequential Function Chart (SFC)



| Time      | Topic                                  | Presenter  |
|-----------|----------------------------------------|------------|
| 8:00      | Introduction Structured Text           | Kohlbacher |
| 9:00      | Practice Strucutred Text               | Kohlbacher |
| 10:30     | Introduction Sequential Function Chart | Kohlbacher |
| Afternoon | Practice Sequential Function Chart     | Kohlbacher |

Aimed level for the workshop

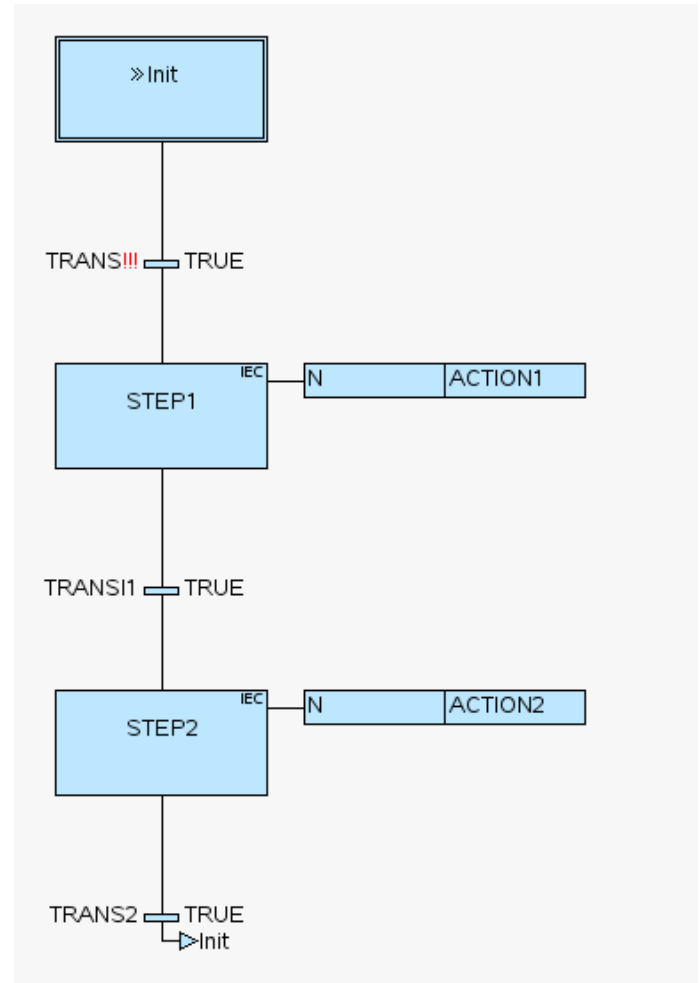




- Graphical programming language from the IEC 61131-3
- Possibility to complex sequential processes
- SFC Network = chain of **STEPS** connected to each other with transition conditions (**TRANSITIONS**)
- Commands that are named **ACTIONS** are connected directly to the steps
- **JUMPS** are a way to make a sequence of steps a bit more flexible



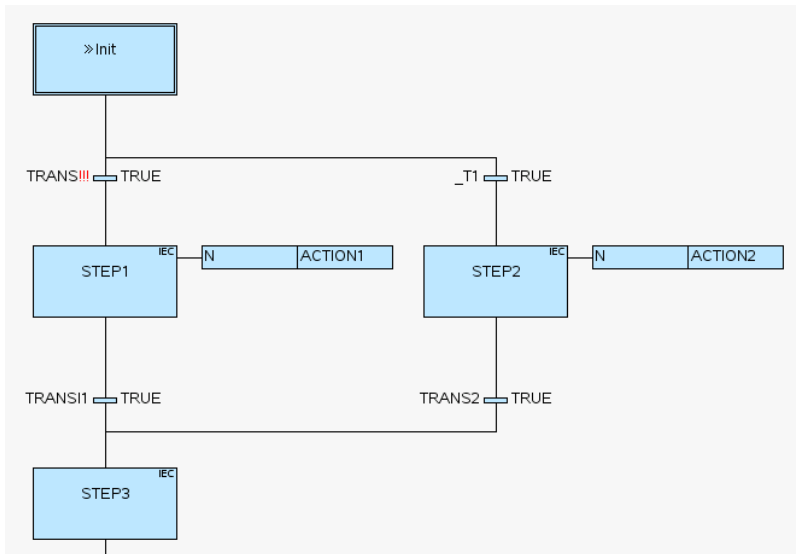
- A step is active or inactive.  
Referenced actions are carried out as long as the step is active
- Every step has Entry-/Cyclic-/Exit-action
- Usage of simple- or IEC-steps in APROL
- A transition is a boolean condition. It allows the logic to jump to the next step
- A SFC always ends with a jump





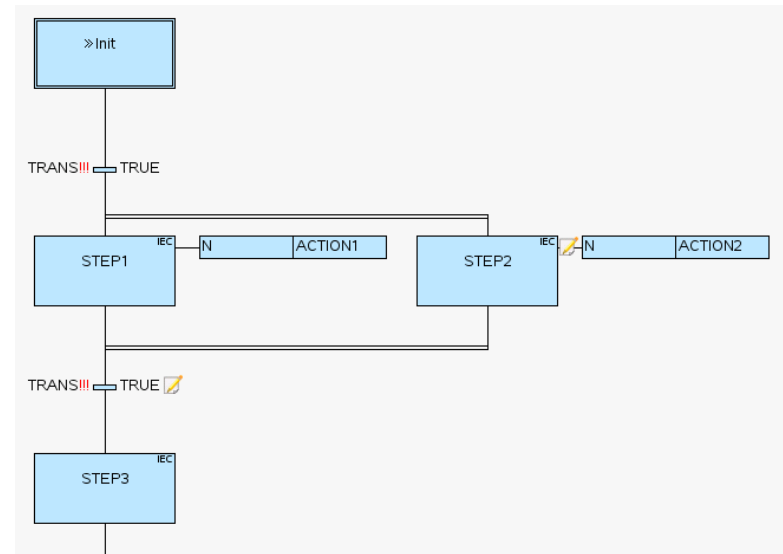
## Alternative path

- Parallel ordered transitions
- First active transition wins
- Priority from left to right



## Simultaneous path

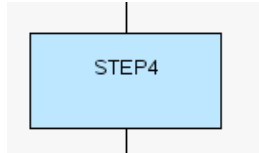
- Parallel ordered steps
- All paths are processed at the same time
- Evaluation of transition after path when last step of all respective paths is active



# Different kind of steps

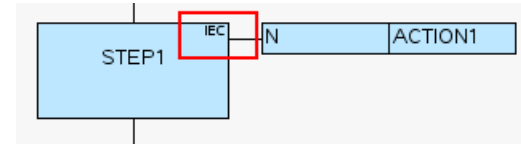


## Simple step

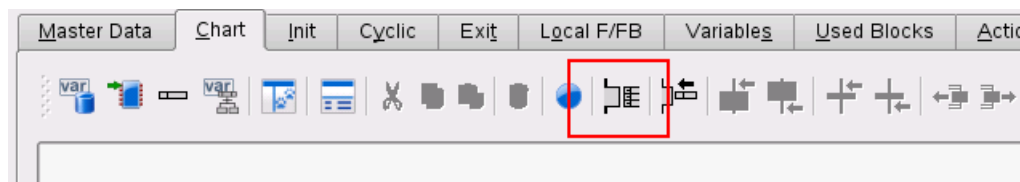


- Lower memory requirement
- 3 possible actions per step
- Acts like an IEC step action using the 'N' action qualifier
- Actions can only be used in this step

## IEC step

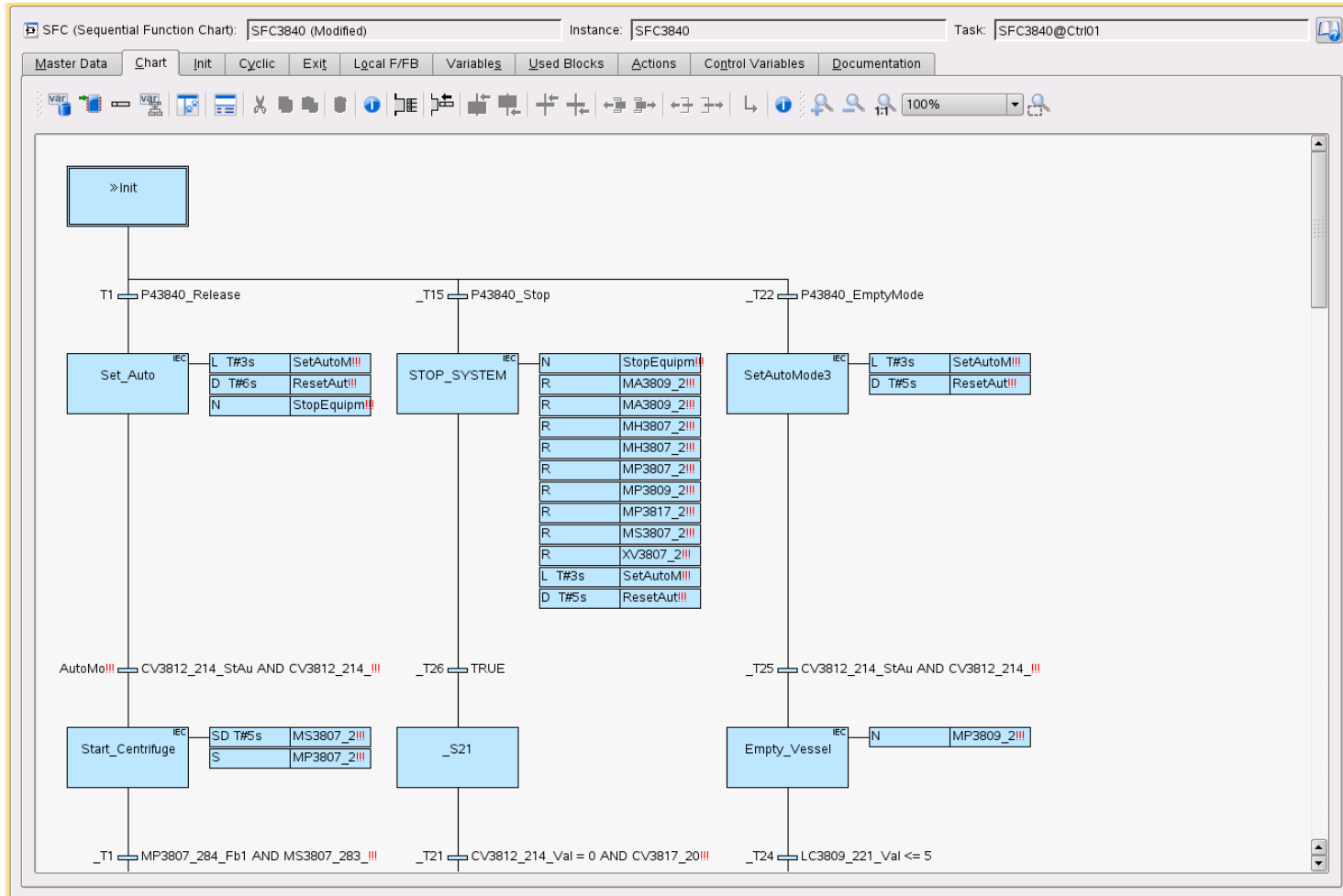


- IEC conform
- Up to 32 actions per step
- Action allocation with action qualifiers defined in the IEC
- Use of existing actions in several different steps





## Graphical configuration of the SFC





## Declaration of local functions and function blocks

SFC (Sequential Function Chart): SFCExample01 Instance: SFCEx01 Task: SFCEx01@CTRL03

Master Data Chart Init Cyclic Exit Local F/FB Variables Used Blocks Actions Control Variables Configuration Errors Documentation

**Declaration**

```
1 FUNCTION LOC_MIN_INT : INT
2   VAR_INPUT
3     IN1 : INT;
4     IN2 : INT;
5   END_VAR
6 END_FUNCTION

7
8 FUNCTION LOC_MAX_REAL : REAL
9   VAR_INPUT
10    IN1 : REAL;
11    IN2 : REAL;
12  END_VAR
13 END_FUNCTION
14
```

**Instantiation**

```
1 VAR RETAIN
2 RS1: LOC_FLIPFLOP;
3 END_VAR
4
5 VAR CONSTANT
6 END_VAR
7
8 VAR
9
10
11 END_VAR
12
```

**Definition**

```
1
2 FUNCTION LOC_MIN_INT
3   IF IN1 < IN2 THEN
4     LOC_MIN_INT := IN1;
5   ELSE
6     LOC_MIN_INT := IN2;
7   END_IF
8 END_FUNCTION
9
10 FUNCTION LOC_MAX_REAL
11   IF IN1 > IN2 THEN
12     LOC_MAX_REAL := IN1;
13   ELSE
14     LOC_MAX_REAL := IN2;
15   END_IF
16 END_FUNCTION
17
18 FUNCTION_BLOCK LOC_FLIPFLOP
19   IF Rin=1 THEN
20     Qout := 0;
21   ELSIF Sin=1 THEN
22     Qout := 1;
23   END_IF
24   QNout := NOT Qout;
25 END_FUNCTION_BLOCK
```





- Variables that are used in transitions, steps and actions are listed

SFC (Sequential Function Chart): SFC3840 (Modified) Instance: SFC3840 Task: SFC3840@Ctrl01

Master Data Chart Init Cyclic Exit Local F/B Variables Used Blocks Actions Control Variables Documentation

### Project Variables

| Name                | IEC Type | Live Value | Direction | I/O | Description            |
|---------------------|----------|------------|-----------|-----|------------------------|
| CV3812_214_Au       | ✓ BOOL   | ---        | →         | Q   | Set Automode           |
| CV3812_214_Ma       | ✓ BOOL   | ---        | →         | Q   | Set Manual Mode        |
| CV3812_214_StAu     | ✓ BOOL   | ---        | →         | Q   | Automode enabled       |
| CV3812_214_Val      | ✓ REAL   | ---        | →         | Q   | <system auto store>    |
| CV3812_214_Y        | ✓ REAL   | ---        | →         | Q   |                        |
| CV3817_201_Au       | ✓ BOOL   | ---        | →         | Q   | Set Automode           |
| CV3817_201_Ma       | ✓ BOOL   | ---        | →         | Q   | Set Manual Mode        |
| CV3817_201_StAu     | ✓ BOOL   | ---        | →         | Q   | Automode enabled       |
| CV3817_201_Val      | ✓ REAL   | ---        | →         | Q   | <system auto store>    |
| CV3817_201_Y        | ✓ REAL   | ---        | →         | Q   |                        |
| CV3817_241_Au       | ✓ BOOL   | ---        | →         | Q   | Set Automode           |
| CV3817_241_Ma       | ✓ BOOL   | ---        | →         | Q   | Set Manual Mode        |
| CV3817_241_StAu     | ✓ BOOL   | ---        | →         | Q   | Automode enabled       |
| CV3817_241_Val      | ✓ REAL   | ---        | →         | Q   | <system auto store>    |
| CV3817_241_Y        | ✗ REAL   | ---        | →         | Q   | Control Value Automode |
| DC3817_201_Val      | ✓ REAL   | ---        | →         | Q   | Value                  |
| LC3809_221_Val      | ✓ REAL   | ---        | →         | Q   | Value                  |
| MA3809_281_Au       | ✓ BOOL   | ---        | →         | Q   | Set Auto Mode          |
| MA3809_281_CmdAuto1 | ✓ BOOL   | ---        | →         | Q   | <system auto store>    |
| MA3809_281_CmdAuto2 | ✓ BOOL   | ---        | →         | Q   | <system auto store>    |
| MA3809_281_Fb0      | ✓ BOOL   | ---        | →         | Q   | <system auto store>    |
| MA3809_281_Fb1      | ✓ BOOL   | ---        | →         | Q   | <system auto store>    |
| MA3809_281_Ma       | ✓ BOOL   | ---        | →         | Q   | Set Manual Mode        |
| MA3809_281_StAu     | ✓ BOOL   | ---        | →         | Q   | Automode enabled       |
| MH3807_282_Au       | ✓ BOOL   | ---        | →         | Q   |                        |

### Local Variables

| Name             | Category   | Pin Type/Data Type | Direction | Project Variable | Live Value | Constant | Remanent  | Default Value | Description         |
|------------------|------------|--------------------|-----------|------------------|------------|----------|-----------|---------------|---------------------|
| V3809_Amount_C   | ✓ IEC type | REAL               | →         |                  | ---        | True (1) | False (0) | 20            | <system auto store> |
| V3809_Den_W      | ✓ IEC type | REAL               | →         |                  | ---        | True (1) | False (0) | 1100          | <system auto store> |
| V3809_MinFillStr | ✓ IEC type | REAL               | →         |                  | ---        | True (1) | False (0) | 25            | <system auto store> |



- Function blocks in this project part intended for use are listed

|                                                     |  |                   |                      |                      |              |                    |                                 |                      |         |                   |               |
|-----------------------------------------------------|--|-------------------|----------------------|----------------------|--------------|--------------------|---------------------------------|----------------------|---------|-------------------|---------------|
| SFC (Sequential Function Chart): SFC3840 (Modified) |  | Instance: SFC3840 |                      | Task: SFC3840@Ctrl01 |              |                    |                                 |                      |         |                   |               |
| Master Data                                         |  | Chart             | Init                 | Cyclic               | Exit         | Local F/FB         | Variables                       | Used Blocks          | Actions | Control Variables | Documentation |
| Instance/Variable                                   |  | Remanent          | Pin Type/FB/IEC Type | Live Value           | I/O Constant | I/O                | Block Description               | Instance Description |         |                   |               |
| LAG1_1                                              |  |                   | IEC61131_3_LAG1      | ---                  | ---          | ---                | First order delay element (PT1) | ---                  |         |                   |               |
| LAG1_1_r.XOUT                                       |  | remanent          | REAL                 | ---                  | ---          | Output             | Output                          | ---                  |         |                   |               |
| LAG1_1_v.CYCLE                                      |  | volatile          | TIME                 | ---                  | T#1s         | Scan rate          | Scan rate                       | ---                  |         |                   |               |
| LAG1_1_v.RUN                                        |  | volatile          | BOOL                 | ---                  | False (0)    | Enable             | Enable                          | ---                  |         |                   |               |
| LAG1_1_v.TAU                                        |  | volatile          | TIME                 | ---                  | T#1s         | Filter time        | Filter time                     | ---                  |         |                   |               |
| LAG1_1_v.XIN                                        |  | volatile          | REAL                 | ---                  | 0            | Input              | Input                           | ---                  |         |                   |               |
| RAMP_1                                              |  |                   | IEC61131_3_RAMP      | ---                  | ---          | ---                | Time based ramp building        | ---                  |         |                   |               |
| RAMP_1_r.BUSY                                       |  | remanent          | BOOL                 | ---                  | ---          | Busy state         | Busy state                      | ---                  |         |                   |               |
| RAMP_1_r.XOUT                                       |  | remanent          | REAL                 | ---                  | ---          | Output             | Output                          | ---                  |         |                   |               |
| RAMP_1_v.RUN                                        |  | volatile          | BOOL                 | ---                  | False (0)    | Enable             | Enable                          | ---                  |         |                   |               |
| RAMP_1_v.TR                                         |  | volatile          | TIME                 | ---                  | 0            | Ramp time duration | Ramp time duration              | ---                  |         |                   |               |
| RAMP_1_v.X0                                         |  | volatile          | REAL                 | ---                  | 0            | Start value        | Start value                     | ---                  |         |                   |               |
| RAMP_1_v.X1                                         |  | volatile          | REAL                 | ---                  | 0            | Final value        | Final value                     | ---                  |         |                   |               |



## Local actions that can be controlled in the steps of the SFC

SFC (Sequential Function Chart): SFC3840 (Modified) Instance: SFC3840 Task: SFC3840@Ctrl01

Master Data Chart Init Cyclic Exit Local F/BB Variables Used Blocks Actions Control Variables Documentation

Declaration

| Name             |   | Description |
|------------------|---|-------------|
| ResetAutoManMode | ✓ |             |
| SetAutoMode      | ✓ |             |
| SetManualMode    | ✓ |             |
| StopEquipment    | ✓ |             |

Definition

```
1 ACTION ResetAutoManMode:
2
3   CV3812_214_Au := 0;
4   CV3817_201_Au := 0;
5   CV3817_241_Au := 0;
6   MA3809_281_Au := 0;
7   MH3807_282_Au := 0;
8   MP3807_284_Au := 0;
9   MP3817_281_Au := 0;
10  MP3809_283_Au := 0;
11  MS3807_283_Au := 0;
12  XV3807_262_Au := 0;
13
14  CV3812_214_Ma := 0;
15  CV3817_201_Ma := 0;
16  CV3817_241_Ma := 0;
17  MA3809_281_Ma := 0;
18  MH3807_282_Ma := 0;
19  MP3807_284_Ma := 0;
20  MP3817_281_Ma := 0;
21  MP3809_283_Ma := 0;
22  MS3807_283_Ma := 0;
23  XV3807_262_Ma := 0;
24
25
26 END_ACTION
27
```



- Additional functions can be activated with the declaration and usage of SFC control variables

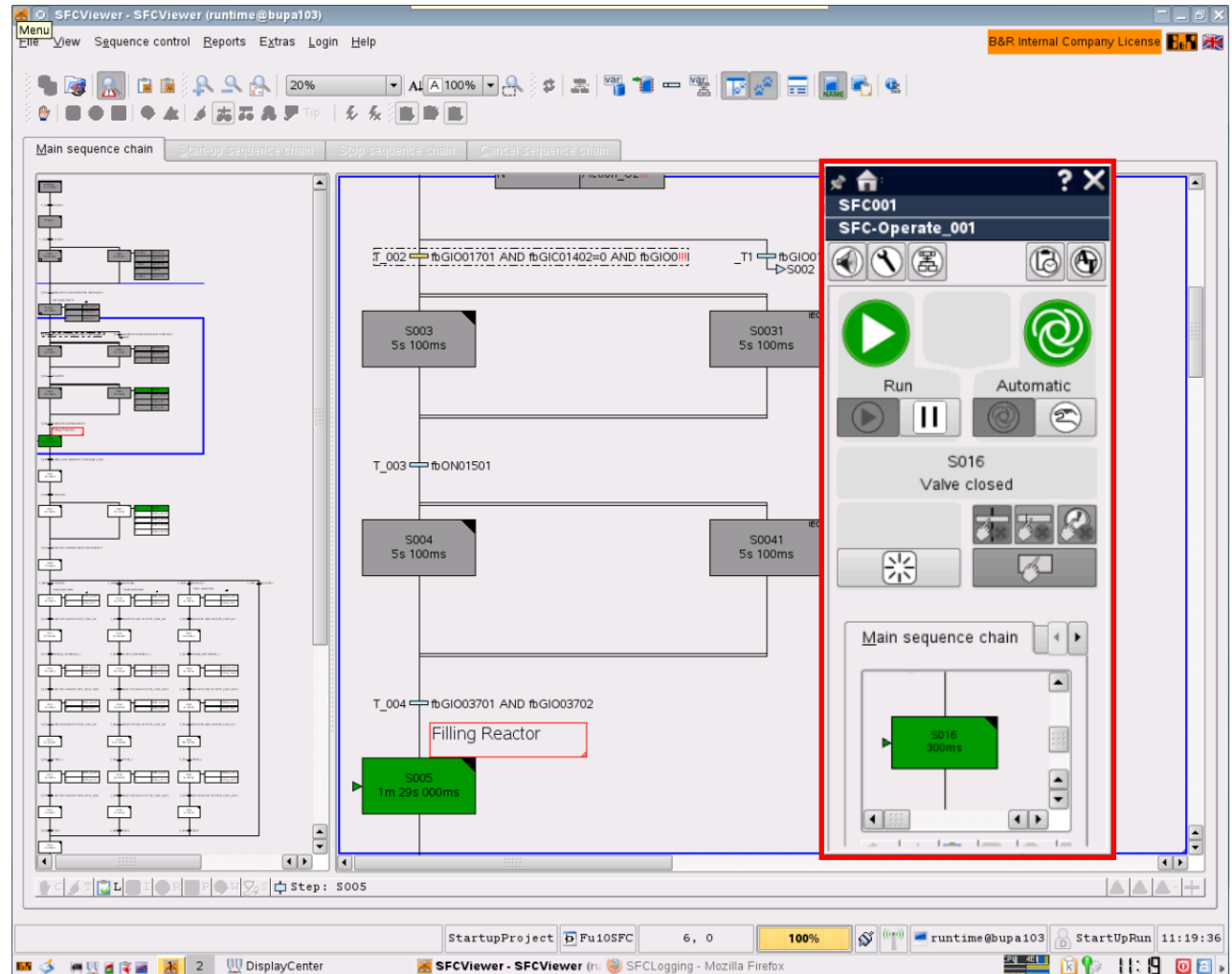
SFC (Sequential Function Chart): SFC3840 (Modified) Instance: SFC3840 Task: SFC3840@Ctrl01

Master Data Chart Init Cyclic Exit Local F/BB Variables Used Blocks Actions Control Variables Documentation

| Name                       | Pin Type/Data Type       | Direction | Project Variable               | Live Value | Constant  | Remanent  | Default Value                       | Description                 |
|----------------------------|--------------------------|-----------|--------------------------------|------------|-----------|-----------|-------------------------------------|-----------------------------|
| SFCCheckError              | ✗ BOOL                   | →         | SFC3840_SFCCheckError          | ---        | False (0) | False (0) |                                     | TRUE if an error has be     |
| SFCCheckMode               | ✗ SFCCheckMode (USINT)   | →         | SFC3840_SFCCheckMode           | ---        | False (0) | False (0) |                                     | Sets the mode for the s     |
| SFCCurrentStep             | ✗ SSTRING                | →         | SFC3840_CurrentStep            | ---        | False (0) | False (0) |                                     | Displays the name of th     |
| SFCEnableLimit             | ✗ BOOL                   | →         | SFC3840_EnableLimit            | ---        | False (0) | False (0) |                                     | Enable recording of viol    |
| SFCError                   | ✗ BOOL                   | →         | SFC3840_Error                  | ---        | False (0) | False (0) |                                     | Indicates violations of ti  |
| SFCErrorPOU                | ✗ SSTRING                | →         | SFC3840_ErrorPOU               | ---        | False (0) | False (0) |                                     | Displays the name of th     |
| SFCErrorStep               | ✗ SSTRING                | →         | SFC3840_ErrorStep              | ---        | False (0) | False (0) |                                     | Displays the name of th     |
| SFCForceActionActive       | ✗ BOOL                   | →         | SFC3840_SFCForceActionActive   | ---        | False (0) | False (0) |                                     | TRUE if an action in the    |
| SFCForceActionInactive     | ✗ BOOL                   | →         | SFC3840_SFCForceActionInactive | ---        | False (0) | False (0) |                                     | TRUE if an action in the    |
| SFCForceActionStepInactive | ✗ BOOL                   | →         | SFC3840_SFCForceASStepInactive | ---        | False (0) | False (0) |                                     | TRUE if an action that i    |
| SFCForceStepActive         | ✗ BOOL                   | →         | SFC3840_SFCForceStepActive     | ---        | False (0) | False (0) |                                     | TRUE if a step in the SI    |
| SFCForceStepInactive       | ✗ BOOL                   | →         | SFC3840_SFCForceStepInactive   | ---        | False (0) | False (0) |                                     | TRUE if a step in the SI    |
| SFCForceTransActive        | ✗ BOOL                   | →         | SFC3840_SFCForceTransActive    | ---        | False (0) | False (0) |                                     | TRUE if a transition cor    |
| SFCForceTransInactive      | ✗ BOOL                   | →         | SFC3840_SFCForceTransInactive  | ---        | False (0) | False (0) |                                     | TRUE if a transition cor    |
| SFCInit                    | ✗ BOOL                   | →         | SFC3840_Init                   | ---        | False (0) | False (0) |                                     | Resets the SFC program      |
| SFCInstance                | ✗ SSTRING                | →         |                                | ---        | False (0) | False (0) |                                     | Contains the Chronolog      |
| SFCLoggingMode             | ✗ SFCLoggingMode (USINT) | →         |                                | ---        | False (0) | False (0) | Sequence, control, context data (7) | Enables logging for the     |
| SFCPause                   | ✗ BOOL                   | →         | SFC3840_SFCPause               | ---        | False (0) | False (0) |                                     | Pauses the execution c      |
| SFCQuitError               | ✗ BOOL                   | →         | SFC3840_SFCQuitError           | ---        | False (0) | False (0) |                                     | If the variable is set to T |
| SFCSystemVariables         | ✗ UDINT                  | →         | SFC3840_SFCSystemVariables     | ---        | False (0) | False (0) |                                     | Contains the SFC syste      |
| SFCtip                     | ✗ BOOL                   | →         | SFC3840_SFCTip                 | ---        | False (0) | False (0) |                                     | If TRUE, all transitions :  |
| SFCtipConditional          | ✗ BOOL                   | →         | SFC3840_SFCTipConditional      | ---        | False (0) | False (0) |                                     | If TRUE, a stepping with    |
| SFCtipDisableAction        | ✗ BOOL                   | →         | SFC3840_SFCTipDisableAction    | ---        | False (0) | False (0) |                                     | If TRUE, none of the ste    |
| SFCtipDisableDuration      | ✗ BOOL                   | →         | SFC3840_SFCTipDisableDuration  | ---        | False (0) | False (0) |                                     | If TRUE and SFCTip is       |
| SFCtipLock                 | ✗ BOOL                   | →         | SFC3840_SFCTipLock             | ---        | False (0) | False (0) |                                     | If TRUE, the variables S    |
| SFCtipMode                 | ✗ BOOL                   | →         | SFC3840_SFCTipMode             | ---        | False (0) | False (0) |                                     | If TRUE, all transition c   |
| SFCTrans                   | ✗ BOOL                   | →         | SFC3840_Trans                  | ---        | False (0) | False (0) |                                     | This variable becomes "     |



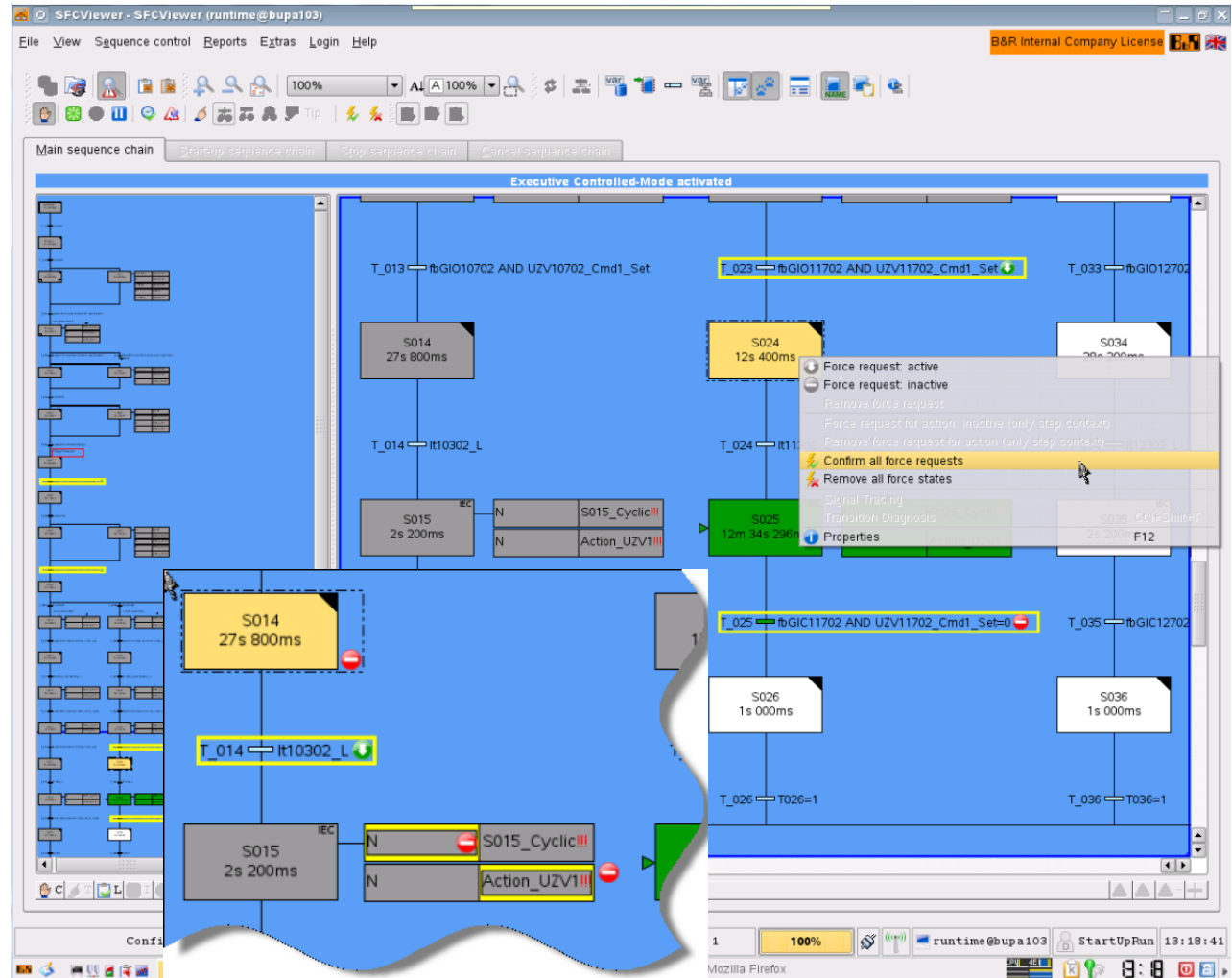
# Live presentation with APROL SFC-Editor





## Controlled-Mode

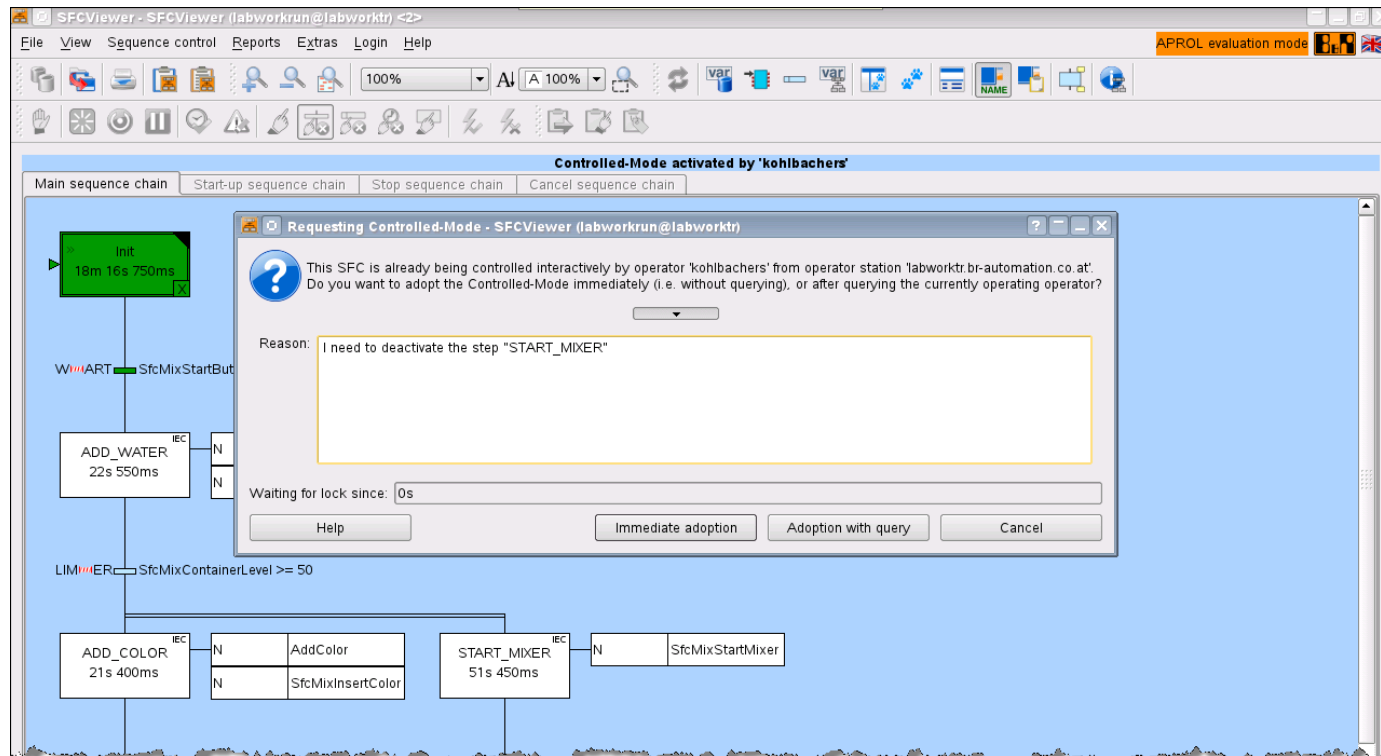
- Force of transitions
- Force of steps
- Force of actions in context of the step
- Force of actions in context of the SFC





## Interlocking of the Controlled-Mode

- Request adoption with query
- Request adoption immediately

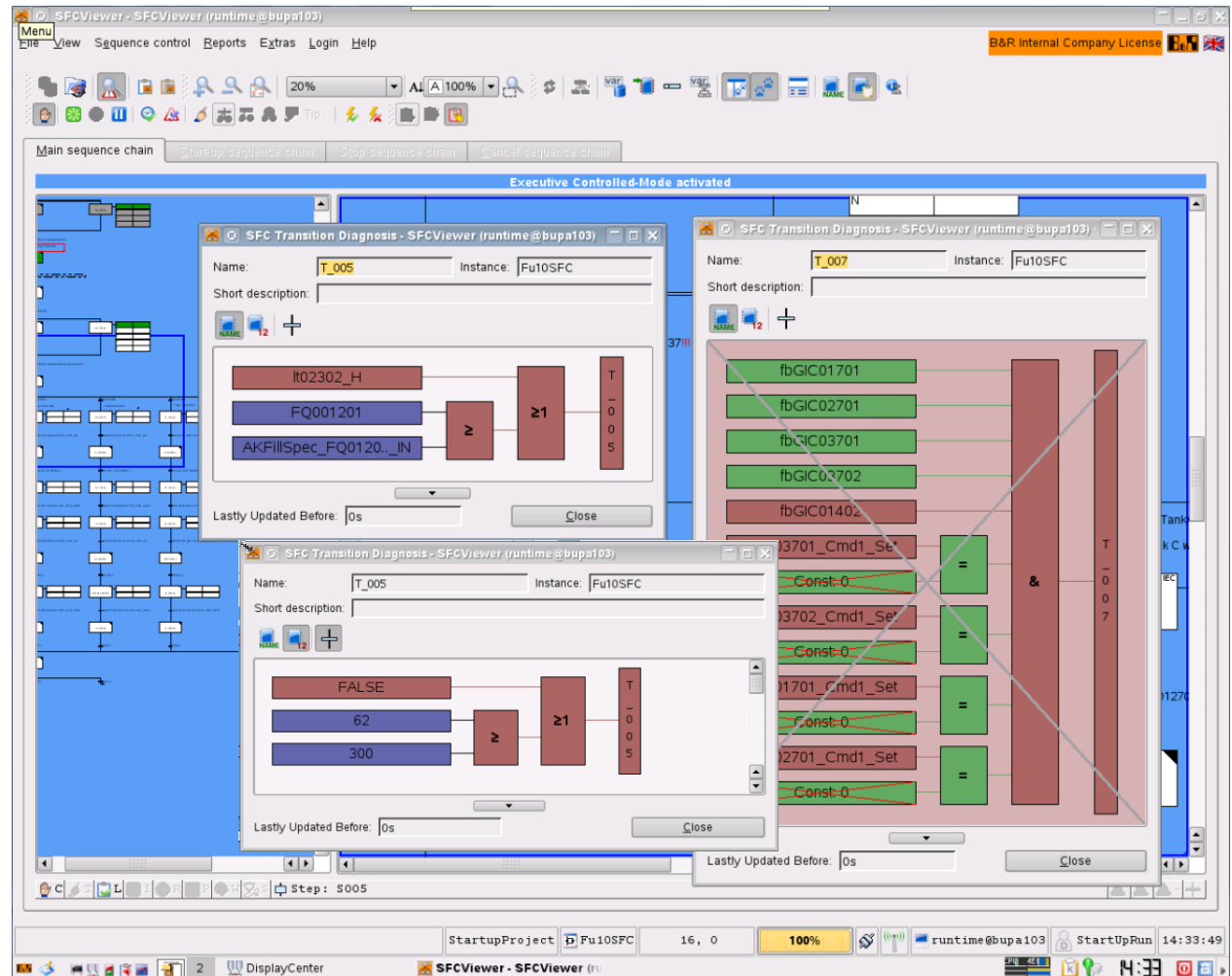






## Transition-diagnosis

- Generic creation out of the ST-code
- Color-differentiation
  - Digital values
  - Analog values
- Display of the evaluation
  - By crossing/  
background color





## Step-diagnosis

- Generic creation out of the ST-code
- Show expected values of variables
- Configuration in engineering

The screenshot shows the SFCViewer application interface. The main window displays a sequence diagram with steps: 'Init' (7m 22s 975ms), 'ADD\_WATER' (22s 550ms), 'ADD\_COLOP' (21s 400ms), and a transition 'LIM//OR SfcMixContainerLevel >= 93'. A 'Step Diagnosis' dialog box is open, showing details for the 'Init' step (Instance: SFCMix1). The dialog includes a table of used variables and pins.

| Position          | Typ / Name / Control Value | Live Value | Value Before | Expected Value    | Value After | IEC type | Usage | Description | Usage Location |
|-------------------|----------------------------|------------|--------------|-------------------|-------------|----------|-------|-------------|----------------|
| Project Variables |                            |            |              |                   |             |          |       |             |                |
| 2                 | SfcMixValve                | 0          | 0            | UnknownVarUseType | ---         | BOOL     | →     |             |                |
| 1                 | SfcMixPump                 | 0          | 0            | UnknownVarUseType | ---         | BOOL     | →     |             |                |
| Local Variables   |                            |            |              |                   |             |          |       |             |                |
| 4                 | locVar                     | 1          | 1            | UnknownVarUseType | ---         | REAL     | →     |             |                |
| 3                 | locCnt                     | 4549       | 752          | UnknownVarUseType | ---         | REAL     | →     |             |                |

Start time: 11/05/2013 09:38:22 143 CET

Buttons: Properties, Close

Bottom status bar: APROL R 3.9-08 | Apr1ECamp | SFCMixerControl | 6, 3 | 100% | labworkrun@labworktr | kohlbachers | 09:51:39



## Separate operator-rights

- Start SFCViewer
- Tip
- Force
- etc.

## More sequence-chains/SFC

- Start-up
- **Main**
- Cancel
- Stop

The screenshot displays the SFCViewer runtime interface. At the top, a menu bar includes File, View, Sequence control, Reports, Extras, Login, and Help. Below the menu is a toolbar with various icons. A red box highlights the 'Main sequence chain' section, which contains buttons for 'START', 'STOP', and 'ABBRUCH'. The main area shows a sequence control diagram with steps and transitions. A table at the bottom lists the steps and actions, including their positions, types, live values, and force states.

| Step / Actions | Pos. | AQ      | Type          | Live value | Force state | Min. / Max. time |
|----------------|------|---------|---------------|------------|-------------|------------------|
| InitStep       |      |         | Simple step   | 11s 600ms  |             | T#1s             |
| S000           |      |         | Simple step   | 11s 400ms  |             |                  |
| S001           |      |         | Simple step   | 19s 800ms  |             | T#5s             |
| S0011          |      |         | IEC step      | 19s 800ms  |             | T#5s             |
| Action1        | 4    | N       | Action        | 19s 800ms  |             |                  |
| StGIO1102      | 5    | D T#0s  | Action (bool) | 4s 800ms   |             |                  |
| StGIO1103      | 1    | SD T#0s | Action (bool) | 14s 900ms  |             |                  |
| StGIO1104      | 2    | S       | Action (bool) | 24s 900ms  |             |                  |
| StGIO1105      | 3    | L T#0s  | Action (bool) | 19s 800ms  |             |                  |
| S002           |      |         | IEC step      | 5s 000ms   |             | T#5s T#10m       |
| S003           |      |         | Simple step   | 5s 100ms   |             | T#5s T#10m       |
| S0031          |      |         | IEC step      | 5s 100ms   |             | T#5s T#10m       |
| S004           |      |         | Simple step   | 5s 100ms   |             | T#5s T#10m       |
| S0041          |      |         | IEC step      | 5s 100ms   |             | T#1s T#10m       |

On the right side, a window titled 'Rechte von reichingerm' displays a list of permissions with green checkmarks indicating they are all granted. The permissions include:

- ControllerManager: Start
- ControllerManager: Variablen forcen
- ControllerManager: Download und neu starten
- SFCViewer: Start**
- SFCViewer: Auswahl
- SFCViewer: Logging
- SFCViewer: Eigendiagnose
- SFCViewer: Ablaufsteuerung
- SFCViewer: Tip-Modus
- SFCViewer: Tip-Modus (uneingeschränkt)
- SFCViewer: Schritte forcen
- SFCViewer: Aktionen forcen
- SFCViewer: Transitionen forcen
- SFCViewer: Fehler zurücksetzen
- SFCViewer: Zeitüberwachung
- TranslationManager: Start
- LogisticManager: Start

At the bottom right, a small diagram shows a transition T\_016 leading to a step S040 with a 1s 000ms timer.



## Separate ChronoLog-Container

## SFCLogging Report

- Sequence data
- Context data
- Control data

SFCLogging report - Filtered

06/08/2012 00:00:00 - 06/08/2012 24:00:00 | 100 Results / Page | Project...

Display of table columns

- ☒ Time
- ☒ D
- ☒ F
- ☒ S
- ☒ E
- ☒ Object name
- ☒ Object type
- ☒ Project
- ☒ Instance
- ☒ SFC name
- ☒ Task
- ☒ Controller-Instance
- ☒ Batch id
- ☒ Batch name
- ☒ Batch step
- ☒ A
- ☒ O
- ☒ User fields

Select all | Select none | Cancel | OK

| Time                    | D | F | S | E | Object name | Object type | Project        | Instance     | SFC name | Task | Controller-Instance | Batch id | Batch name | Batch step | A | O | User fields |
|-------------------------|---|---|---|---|-------------|-------------|----------------|--------------|----------|------|---------------------|----------|------------|------------|---|---|-------------|
| 06/08/2012 13:06:06.470 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:06:06.470 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:53.970 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:53.970 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:52.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:52.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:47.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:47.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:36.170 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:36.170 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:33.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:33.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:32.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:32.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:32.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:25.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:25.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:25.870 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:20.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:20.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:20.670 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:05.370 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:05.370 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:05.370 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |
| 06/08/2012 13:05:00.170 | → | → | → | → | S           |             | StartupProject | unkown_inst/ |          |      |                     |          |            |            |   |   |             |

StartupProject | Fu10SFC | 33, 3 | 100% | runtime@bupa103 | StartupRun | 13:46:55

2 | DisplayCenter | SFCViewer - SFCViewer (runt) | SFCLogging - Mozilla Firef



## Characterization of the SFC objects

### ● Name or short description

- Selection via toolbar

### ● Free positioned text

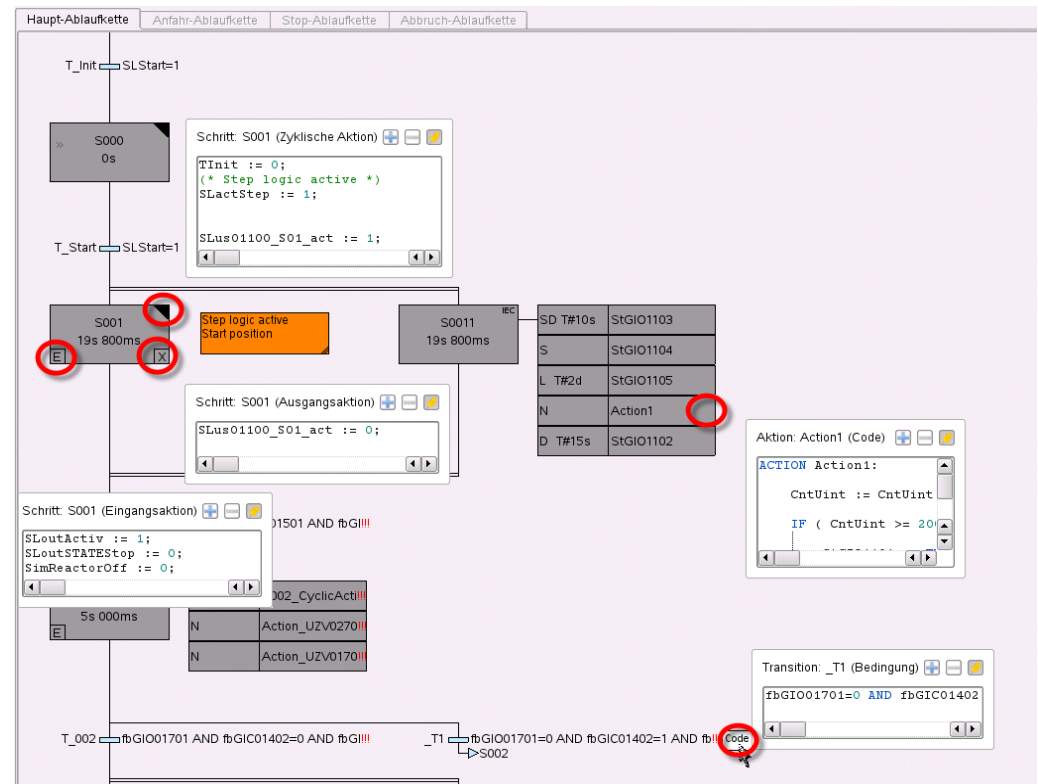
- One or more lines

### ● Grid-Spacing / Object width and height

- Horizontal and vertical spacing of the SFC objects

### ● Info boxes

- Possibility to show program code





# Live presentation with APROL SFCViewer



# **YOUR GLOBAL PARTNER FOR AUTOMATION EXCELLENCE**