LMS SCADAS XS
LMS Smart Scope

LMS SCADAS XS and Smart Scope at a glance

LMS SCADAS XS Hardware overview:

- Modes of Operation
    - Wi-Fi (connected to Smart Scope app)
    - Standalone
    - Front-end (connected to Test.Lab) via USB
- Input channels
    - Binaural headset, SPDIF Binaural input
    - Voltage/ICP, GPS, CAN, Tacho
- Data storage on microSD card

LMS Smart Scope app overview:

- Measurement template
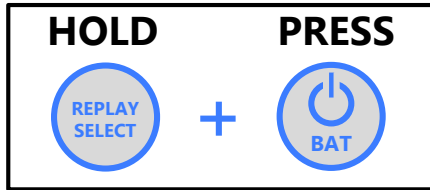- Measurement control
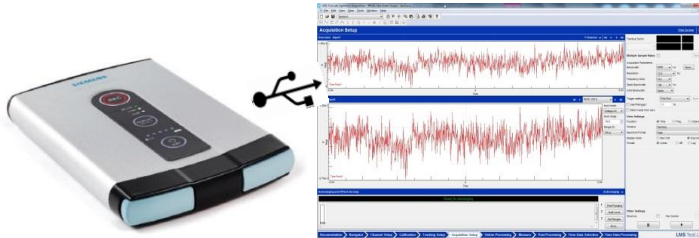- Data Processing on tablet

LMS SCADAS XS – Buttons...

REC/ STOP

MODE STATUS LIGHTS

REPLAY LAST MODE SELECT

POWER On/Off MODE SELECT

LMS SCADAS XS – 3 Operation Modes

To toggle between different modes

HOLD + **PRESS**

REPLAY SELECT + BAT

If you Hold BAT, XS will power down!

Wi-Fi Tablet (SmartScope)

WiFi

00:00:00

Remote Start/Stop Acquisition
Test Setup & Template Selection
Data Verification & Statistics

USB - Front End (Test.Lab)

Measurement Start/Stop controlled by Test.Lab software
Data storage on PC disk
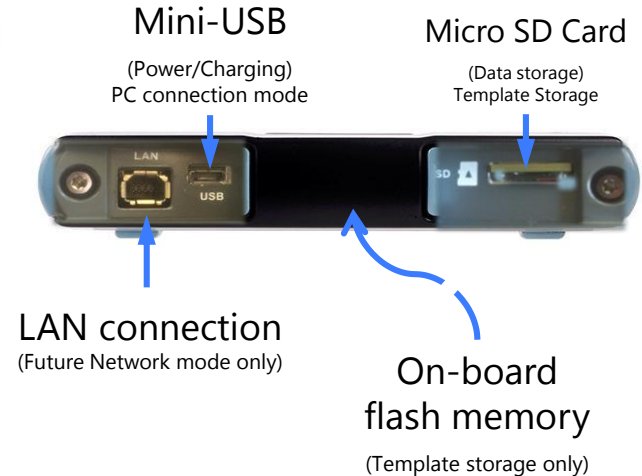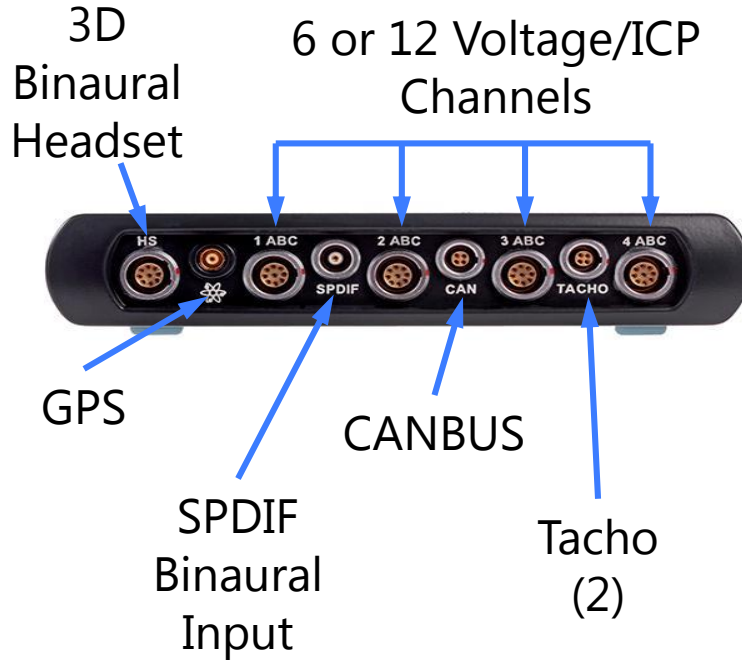Extensive real time and post processing options

Standalone

No tablet required
Uses 1st template (alphabetically) on MicroSD card
Play back last recording (requires headphones)
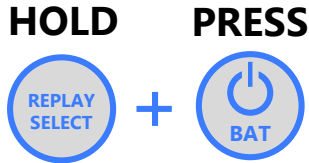
LMS SCADAS XS – Hardware Overview

3D Binaural Headset

6 or 12 Voltage/ICP Channels

GPS

CANBUS

SPDIF Binaural Input

Tacho (2)

Mini-USB

(Power/Charging)
PC connection mode

Micro SD Card

(Data storage)
Template Storage

LAN connection
(Future Network mode only)

On-board flash memory

(Template storage only)

Launching LMS SmartScope

Power On
SCADAS XS

**HOLD BAT till REC
ring starts flashing**

BAT

LMS Smart Sc..

Change XS
mode to WLAN

HOLD   **PRESS**

**REPLAY
SELECT** + **BAT**

Launch
LMS Smart Scope

LMS Smart Scope

Connecting to SCADAS XS via Wi-Fi

Smart Scope app connects automatically to the previously used XS front-end.

Connecting to a different XS frontend is also possible:
- Select a different front-end in Android settings
  or
- Connect to a different front-end at Smart Scope
  or
- Use "Connect To" option inside the app

XS Template Selection Logic in Stand-alone Mode

A template or configuration file (extension .xrdf) is required to acquire data with XS. The selection of the template depends on whether one is present on the SD card or not. Multiple templates may also be present on the SD card. The logic is presented below.

Start Here

Last Template used in XS Flash Memory is chosen

No ← Template(s) present on SD Card in XS? → **Yes**

Alphanumerically first Template on SD card is chosen

Creating a new measurement template

1. Start in MEASURE tab.
2. Tap on NEW CONFIGURATION

Different pages available for different channel types

ADC channel definition

3D Binaural Headset Setup

Tri-axial accelerometer setup

All other transducers need to be set up, there will be no default settings.
Name
Point ID/Direction
Measured Quantity
Unit
Sensitivity
Channel Group (sets sample rate)
ICP/Voltage

DONE Prepare New Configuration   READ HMS CALIBRATION

GPS   CAN   MEASUREMENT

GENERAL

Name — Triax1_z
Enabled — ON
Point ID — Acc_dir_z
Point Direction — +Z
Unit Quantity — Acceleration
Unit — g
Sensitivity — 100.00 [mV/Unit]
Channel Group — Vibration
Sample Rate — 12800 [Hz]

ANALOG

Input Range — 10.00 [V]

2. Set other settings

1A: Triax1_z
Acc_dir_z

1. Select Channel

1B

Tacho setup – RPM

Two tachometers included with SCADAS XS.

GPS activation

CAN setup

SmartScope provides subset of Legislative OBD2 channels (shown on left).

Activation of other CAN channels should be defined in Test.Lab/Test.Xpress through a dbc file (while connected to an XS as a front-end) and saved as a SmartScope template (.xrdf file). When that template is opened in SmartScope, these CAN channels will show up on the left.

Measurement - general acquisition settings

SIEMENS

MEASUREMENT

When setup is complete, hit "DONE"

ADC | RPM | GPS | CAN | MEASUREMENT

MEASUREMENT — Multi-run settings
- Number of Runs: 3
- Dead Time: 0 [s]

FREQUENCY
- System Samplerate: 51200 [Hz]
- Acoustic: 51200
- Vibration: 12800
- Other: 51200 [Hz]

Sample rate of Channel Groups

CAN SETTINGS
- CAN Controller Mode: Active
- Baud Rate: 500 000

CAN Baud rate selection (vehicle dependent)

START TRIGGER
- Mode: Level
- Slope: Down
- Channel: T1: Tacho 1
- Level: 1000.00 [1/min]

STOP TRIGGER
- Mode: Level
- Slope: Down
- Channel: T1: Tacho 1
- Level: 3000.00 [1/min]

Trigger definition

Creating a new measurement template

SIEMENS

MEASURE   RECORDINGS   + NEW CONFIGURATION   ADAPT CONFIGURATION   EDIT

connected to LMS-SCADAS-XS-22B5

MAC1 ✓
18.11.2014, 21:58:00   18.11.2014, 21:58:00   40.4 KB   ▶ Measure

New Template appears in list

RUNUP ✓
23.10.2014, 17:20:00   23.10.2014, 17:20:00   41.3 KB   ▶ Measure

test_xs_4 ✓
11.11.2014, 22:08:00   11.11.2014, 22:08:00   34.6 KB   ▶ Measure

XS_Temp ✓
04.11.2014, 16:49:00   04.11.2014, 16:49:00   35.1 KB   ▶ Measure

Making a Measurement

SIEMENS

5:01

MEASURE   RECORDINGS   + NEW CONFIGURATION   ADAPT CONFIGURATION   EDIT

connected to LMS-SCADAS-XS-22B5

MAC1 ✓
18.11.2014, 21:58:00   18.11.2014, 21:58:00
2. Tap "Measure"
▶ Measure

1. Select template by tapping on the template row anywhere in this area

RUNUP ✓
23.10.2014, 17:20:00   23.10.2014, 17:20:00   41.3 KB
▶ Measure

test_xs_4 ✓
11.11.2014, 22:08:00   11.11.2014, 22:08:00   34.6 KB
▶ Measure

XS_Temp ✓
04.11.2014, 16:49:00   04.11.2014, 16:49:00   35.1 KB
▶ Measure

Starting a Measurement – BASE view

Bar chart display

Persistent press in the display area brings up window with options for Scaling (Lin/dB) and Mode (Min/Mean/Max).

Tap on left side of display shows Scaling and Mode for each channel

Digital display

Strip chart display

Statistics display

CHANNELS		Min (inst)	Min	Max (inst)	Max	Mean (inst)	Mean	STATS
HS Left: left [Pa]	○	-300.0	-300.0	83.9	88.3	0.952	-300.0	
HS Right: right [Pa]	○	-300.0	-300.0	83.4	87.9	5.25	-300.0	
1A: Acc_dir_z [g]	○	-0.019	-1.25	0.017	0.881	-0.000	-2.51E-5	
1B: Acc_dir_x [g]	○	-0.060	-0.087	0.040	0.053	-0.001	6.50E-7	
1C: Acc_dir_y [g]	○	-0.004	-0.005	0.004	0.005	-8.95E-5	1.84E-6	

FUNCTIONS in real time

FUNCTIONS in real time

Open the Functions Selection list. Define processing parameters.

Function Selection

- Time ○
- FFT ●
- Octave ○
- SPL ○
- AI ○
- Loudness ○
- Order ○
- Single Order ○

While Monitoring a Recording

Saving a measurement

Recording 'Setup_multirun_001' saved

Analyze: Enter Analysis mode

Recordings: Switch to Recordings page

Configurations: Switch to Configurations page

Run Comment: Annotate the recording

00:00:00   0 dB   HS Left: left

Analyse   Recordings   Configurations   Run Comment

Start   Done

Analyze – strip chart

Analyze – statistics table

CHANNELS		Min	Max	Mean	RMS	STD
HS Left: left	[Pa]	-300.0	62.8	39.8	49.5	0.006
HS Right: right	[Pa]	-300.0	53.6	23.0	40.0	0.002
1A: Acc_dir_z	[g]	-2.43	0.929	8.35E-5	0.073	0.073

Entering Functions (processing) mode

Pressing on any channel in this display area will take you to analysis display for that channel as shown on next page

Function selection

Tap here to bring up the Function Selection dialog box

Function Selection

- Time
- FFT ●
- Octave
- SPL
- AI
- Loudness
- Order
- Single Order

Parameters selection

FUNCTIONS: FFT

SIEMENS

Setup_triax1_002   FUNCTIONS   ↑↓ PARAMETERS

SUMMARY

X = 1200.0 [Hz]

Y = 65.0 dB [Pa]

HS Left: left

[HS Left : 100%]

FFT: 4096, Hanning, No Weighting

Frequency spectrum
FFT settings under PARAMETERS

Time history
Can move time cursor to see FFT of
different parts of the time history

▶ Start   0:00:00   00:00:00   0 dB

FUNCTIONS: Octaves

Page 35

FUNCTIONS: Loudness

Zooming in Functions

Channel selection for Display and Audio Replay

SIEMENS

Channel selection:
For display and audio replay

Channel Selection

Show Channels — ALL

HS Left	👁	🔊
HS Right	👁	🔊
1A	👁	⊘
T1	👁	⊘
G1	👁	⊘
G2	👁	⊘

Will be replayed on binaural headset

On/off For Audio Replay

On/off For Display

Cancel   ✓ Done

SETUP_TRIAX1_002 | ⚠ READY

STRIP   STATISTICS

CHANNELS   0.0 [s]   17.5 [s]

HS Left: left	[Pa]
HS Right: right	[Pa]
1A: Acc_dir_z	[g]
T1: Tacho 1	[1/min]
G1: GPS1	[m/s]
G2: GPS2	[#]

▶ Start   0:00:00   0 dB

10:27   53%

Audio Replay Control

Replay in FUNCTIONS mode

Select channels and tap Start/Stop to control the replay
Follow the replay progress in the bar

Post-recording Audio Replay

Managing Recordings

1. Start in MEASURE tab.
2. Select a template
3. Tap on RECORDINGS tab.

Managing Recordings

Tap on Edit

All Recordings for template chosen in previous page are listed

Managing Recordings

Managing Recordings screen

| DONE | 1 Selected | 🏷 RUN COMMENT | 📄 RENAME | 🗑 DELETE |

Recording

☐ **Z_hs1a_001**
📅 05.11.2015, 20:49   🕐 2.6 MB

☐ **Z_hs1a_002**
📅 05.11.2015, 20:50   🕐 1.6 MB

☑ **Z_hs1a_003**
📅 05.11.2015, 20:51   🕐 3.4 MB

Selection of Recording

SELECTED

Z_hs1a_003

Add run annotation

Rename run

Delete run(s)

Accessing Software and Firmware Version Info

connected to LMS-SCADAS-XS-2AFC

MEASURE | RECORDINGS | NEW CONFIGURATION | ADAPT CONFIGURATION | EDIT

B_1abc ✓
05.11.2015, 20:26 · 42.0 KB

Z_hs1a ✓
05.11.2015, 20:48 · 42.0 KB

XS info
Support
Connect To
Start Mode
Labeling
Select Views

1. Select a template
2. Tap on 3-dot button.
3. Tap on "XS Info" for template info or on "Support" for SmartScope version

XS Info --Template Information

LMS SCADAS XS
Firmware
3. 2

XS Firmware Version

FPGA Version
37

Autonomy
90 %   [---]

RECORDER STORAGE
Capacity
29.5 GB

Free Space
29.5 GB

Used Space
7.7 MB

Remaining Measurement Time

CONFIGURATION
Name
Z_hs1a

Written by
SmartScope (3.0.0.32)

Info on Application that created this particular template. Does NOT indicate current SmartScope version!

Support Info

Support Info
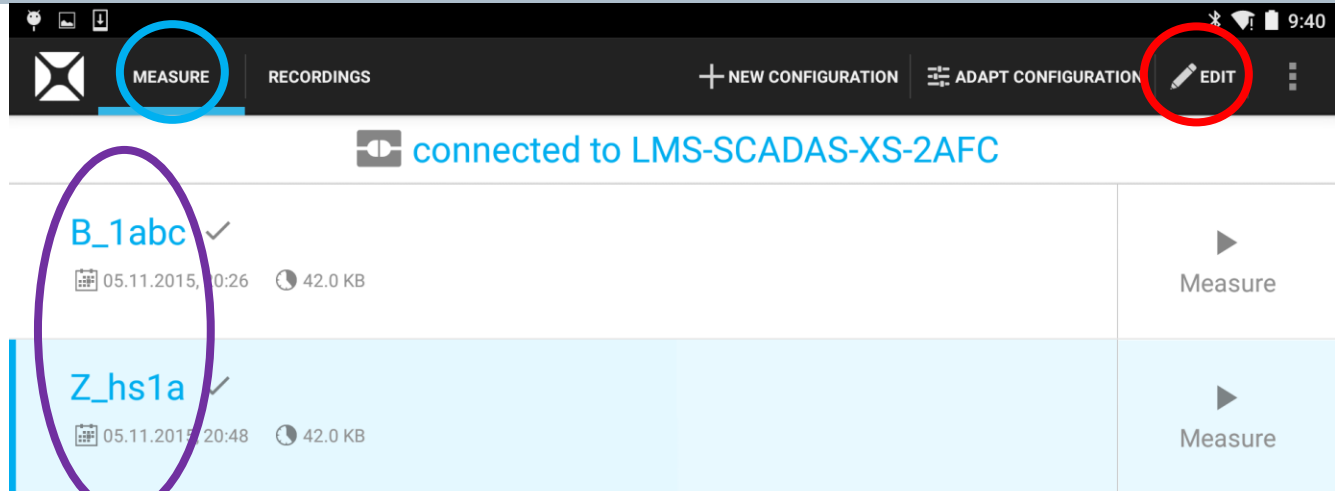
Version : 3.0.0.32

Sold To : 1

Current SmartScope version

✕ Cancel

connected to LMS-SCADAS-XS-2AFC

MEASURE   RECORDINGS   + NEW CONFIGURATION   ADAPT CONFIGURATION   EDIT

B_1abc
05.11.2015,   ► Measure

Z_hs1a
05.11.2015,   ► Measure

Managing Templates on XS Flash Memory and SD card

connected to LMS-SCADAS-XS-2AFC

B_1abc ✓
📅 05.11.2015, 0:26 🕐 42.0 KB

Measure ▶

Z_hs1a ✓
📅 05.11.2015 20:48 🕐 42.0 KB

Measure ▶

1. In MEASURE tab
2. Only Templates shown here
3. Tap on EDIT

Note template Z_hs1a is currently selected.

Selection of Recording

Only the Templates in XS Flash Memory are displayed

Managing Templates on XS Flash Memory and SD card

3:20

DONE   1 Selected   EXPORT   SAVE AS   DELETE   RENAME

Flash Memory

SELECTED
✓ B_1abc

B_1abc ✓
05.11.2015, 20:26   42.0 KB

Tap on Flash Memory to switch to SD Card

Z_hs1a 🔒
05.11.2015, 20:48   42.0 KB

- You have Options to Export, Save as, Delete and Rename the chosen template (if the checked box does not belong to currently selected template i.e. Z_hs1a: refer to page 47).
- If the checked box belongs to currently selected template, only Export and Save as are possible.
- If multiple templates are chosen, then only Export and Delete options are available. Export option transfers template(s) to SD card.
- If multiple templates are chosen, AND one of them is the currently selected template, then only Export option is possible

Managing Templates on XS Flash Memory and SD card

Only the Templates on SD Card are displayed

Managing Templates on XS Flash Memory and SD card
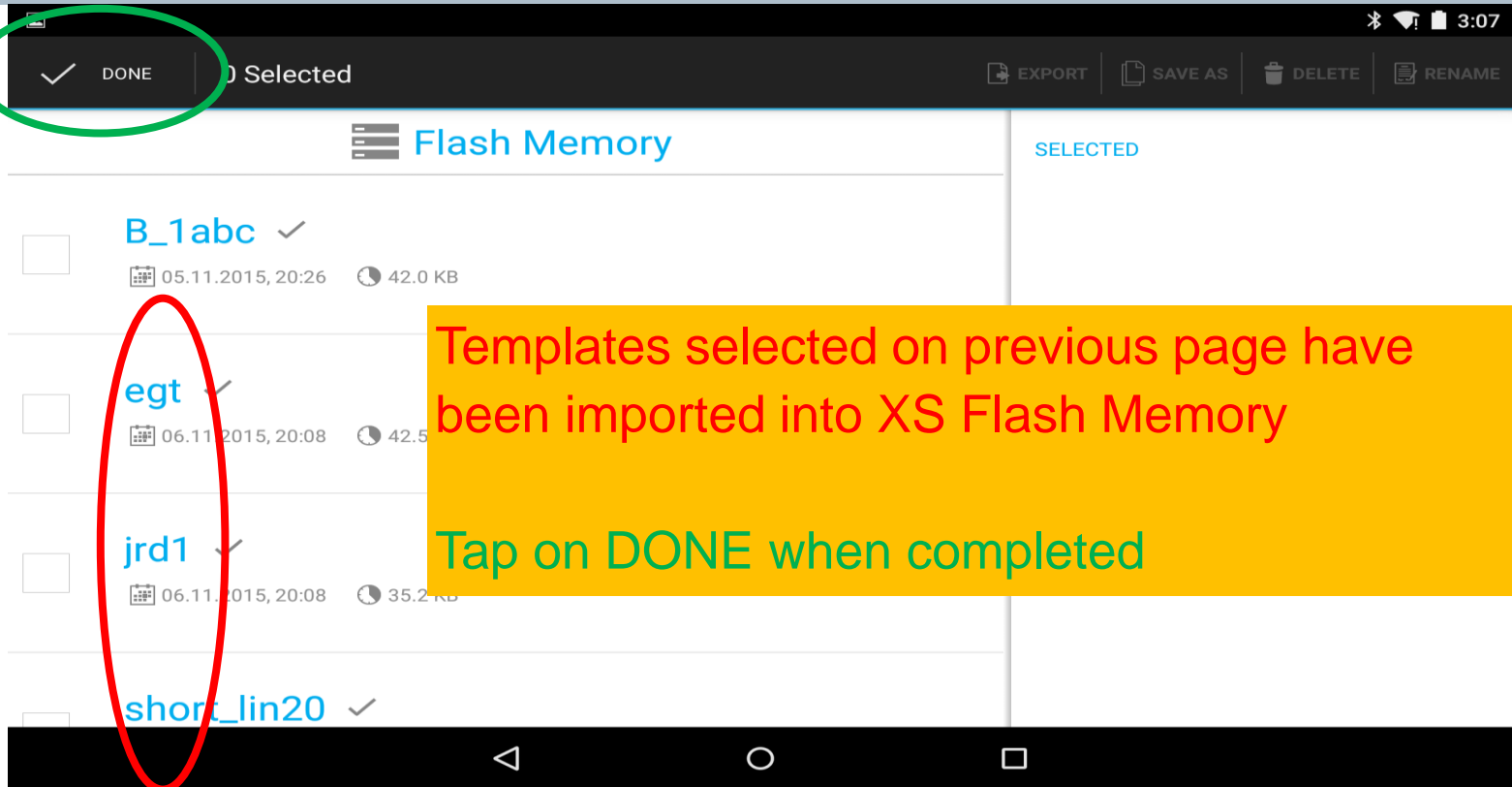

Selected template can be Imported into XS flash memory, Deleted, or Renamed. For multiple selections, renaming is not an option (greyed out).

Click on Import and Tap on SD-Card to switch back to Flash Memory

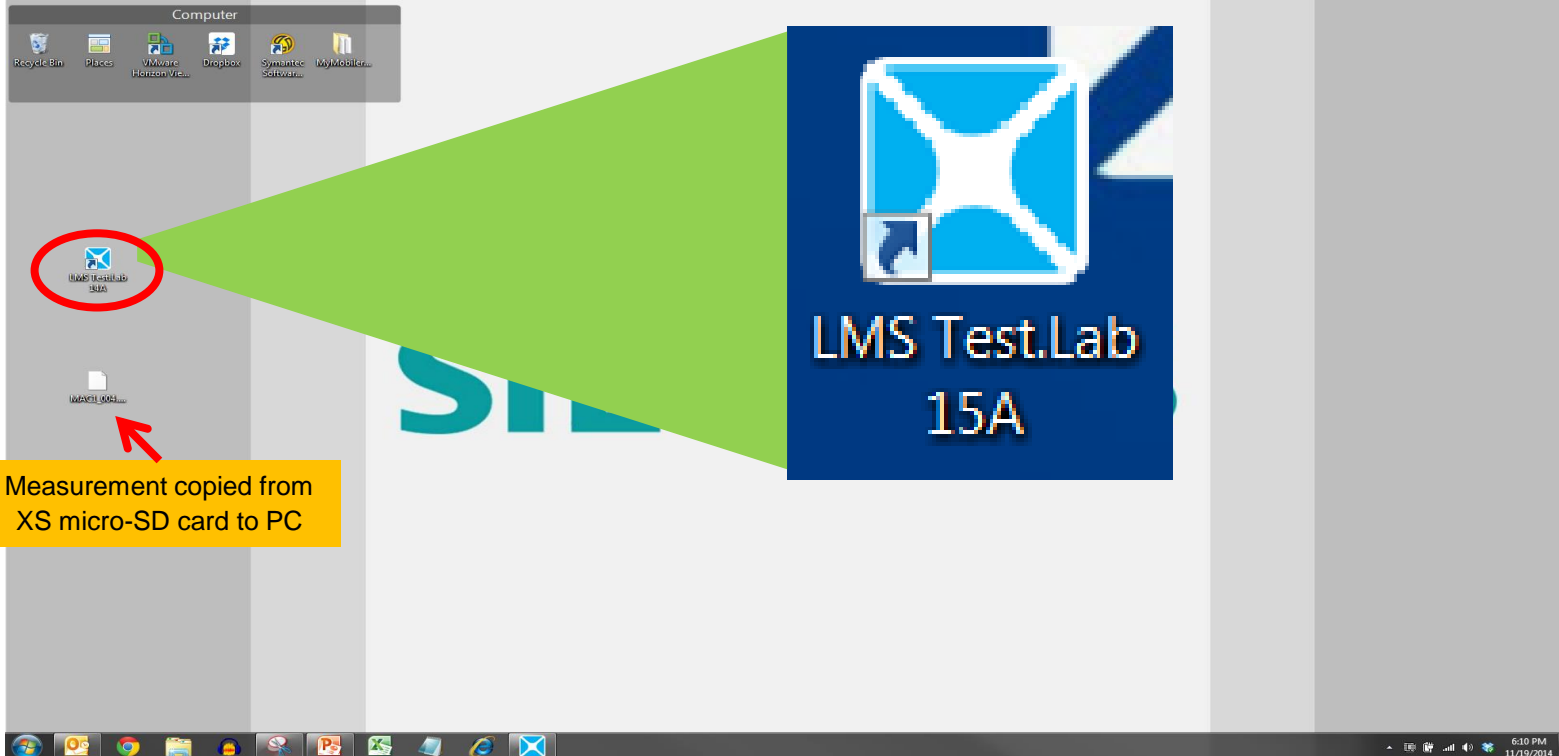# Managing Templates on XS Flash Memory and SD card

SIEMENS

DONE | 0 Selected | EXPORT | SAVE AS | DELETE | RENAME

Flash Memory   SELECTED

B_1abc ✓
📅 05.11.2015, 20:26   🕐 42.0 KB

egt ✓
📅 06.11.2015, 20:08   🕐 42.5

jrd1 ✓
📅 06.11.2015, 20:08   🕐 35.2 KB

short_lin20 ✓

Templates selected on previous page have been imported into XS Flash Memory

Tap on DONE when completed

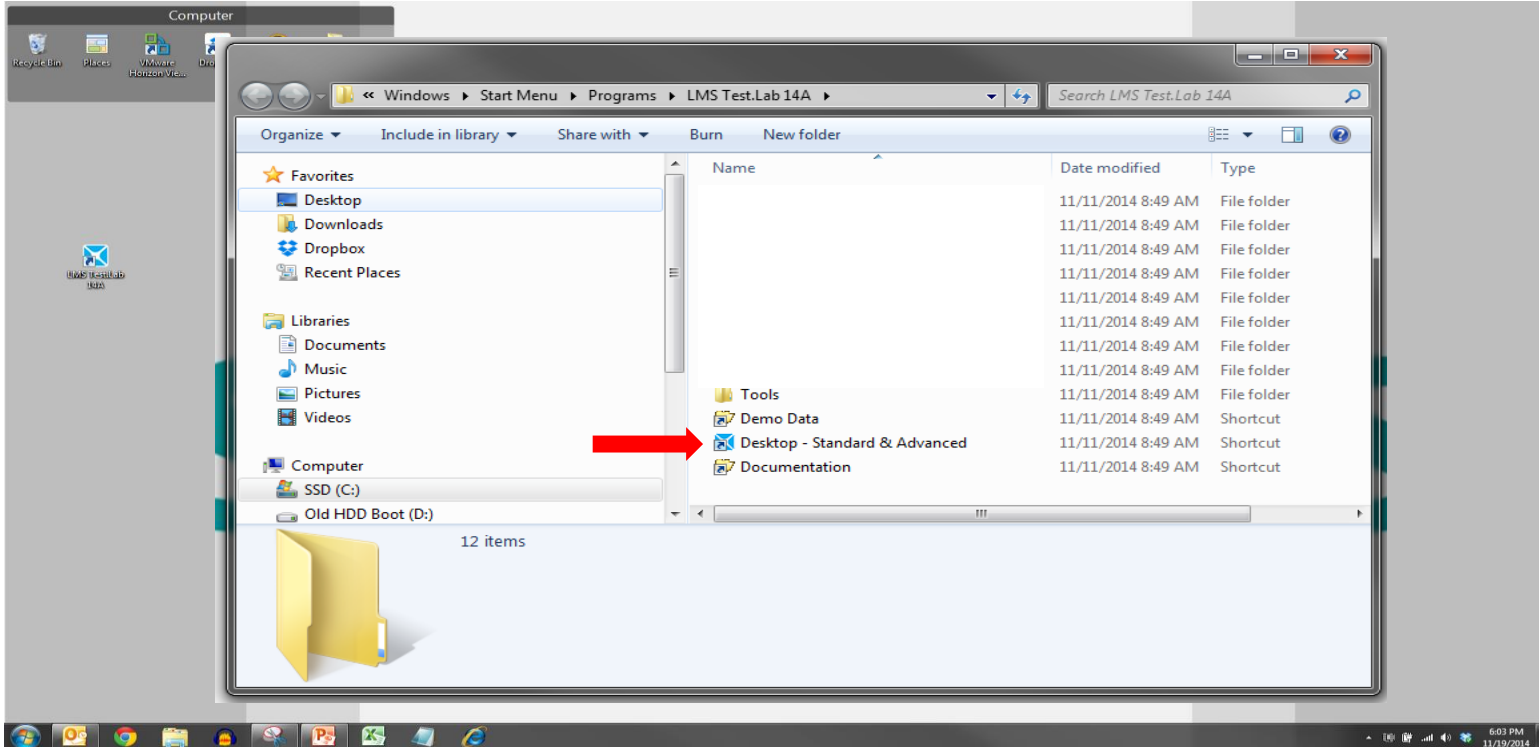In order to import the raw time-histories for further processing, we will use LMS Test.Lab Desktop:

1. Remove micro-SD card from SCADAS XS
2. Insert micro-SD card into SD Card reader (provided)
3. Insert SD card reader into PC, copy or move files to PC
4. Launch LMS Test.Lab Desktop
5. Import files to active project (translates files into LMS "LDSF" file type)
6. Export channels as Universal, Matlab, SDF, WAV, etc.

Steps 4-6 are outlined in the following pages

Open LMS Test.Lab Applications Folder

Measurement copied from XS micro-SD card to PC

LMS Test.Lab 15A

Launch LMS Test.Lab Desktop

Add-in Required

First time set-up: need to add "Stand Alone Recording"

    Tools > Add-Ins > Standalone Recording

This Add-in will be loaded automatically every time Test.Lab Desktop is launched

Importing time history data

1. Drill into "My Computer" to locate data. In this instance, file is in the computer's desktop.
2. Highlight folder which contains data, files are shown in center pane (MAC1_004.xtrp)
3. Right-click on "xtrp" file in center pane
4. Select "Import into Active Project"

Importing time history data

5. Recording now appears in Active Project as run. Drill into folder and highlight blue LDSF icon

6. Channels appear in center pane

LDSF files are now ready for processing in LMS Test.Lab.

7. Right-click on channels in center pane and export to other formats such as Universal, Matlab, SDF, WAV, etc.