

DSH GUI

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Outline



DSH GUI

- SKA elements LMC GUIs
- DSH.LMC GUI specs
- LOFAR GUIs
- LOFAR Navigator GUI
- DSH.LMC GUIs

SKA elements LMC GUIs



- ❑ SKA-TEL-TM-0000031, “SKA1 LMC Interface Guideline”, Rev 01

In a distributed system such as SKA, **each Element provides its own UI designed for its specific UI requirements.** The TM provides the UI to meet the centralized Monitoring and Control functionality. UI manager component in TM performs the function of interaction across UIs in a coordinated way.

The **TM User interface** is designed to provide common UI, as well as Element specific features. **TM defines a coherent purpose, method, and look-and-feel** for the UI. **TM provides the framework** to support UI development and **the set of user libraries** to assist with common UI concerns. **UI framework** ensures a consistency of UI experience across the Element UIs. TM provides **design concept** for a generator program which will be able to generate Element LMC Human Machine Interfaces for each Element that has interface with TM.

SKA elements LMC GUIs



- ❑ SKA-TEL-TM-0000031, “SKA1 LMC Interface Guideline”, Rev 01

UI framework supports the following functions:

- A common **GUI platform** which serves as a **common portal** for access to TM interfaces, and which enables interactions among UIs such as cut-and-paste and coordinated visualization.
- A **library of interface elements**, including visualizations, notifications and interface templates.
- **Common guidelines** for user interface design.
- A **common development environment**, with associated **deployment and verification** processes.

TM UI provides features such as **drilldown**, **co-ordinated navigation**, and **navigation to other UIs**, configurability which will require support from the Element. UI also support **authorization and authentication** for specific interactions like changing some configuration parameters for the Element or setting mode for a Element. **The TM is the main interaction point for the operator and user of the system.**

The TM user interfaces is likely to encompass a variety of interface types like **web-based interfaces**, operator dashboards and **engineer consoles, tool interfaces** (e.g. observation preparation, scheduling, forensic tool), **remote access** etc.

SKA elements LMC GUIs



- ❑ SKA-TEL-TM-0000031, “SKA1 LMC Interface Guideline”, Rev 01

TM Responsibilities

- Provide **framework** for UI development
- Receive and respond to **user actions** from GUI
- Provide **common methods** for requesting Uis from different Elements
- Ability to **deliver visualizations** from **other Elements**. E.g. CSP, SDP and other Elements may wish to construct their own visualization or user experiences for monitoring and performing engineering activities such as tuning, configuration and calibration. TM UIs will support delivery of these user experiences provided by other Elements on the operator / engineer consoles.
- Ability to **drill-down** from dashboards to monitor particular components and parameters, or the sources of alarms.
- Support **access from remote** locations (outside the observatory trust zone) with appropriate additional security. **Authentication and authorization** support based on trust zones will be built into the TM UI architecture both for data access and operations.
- **Host the Element UI** which will be shown to operator. For e.g. TM hosts the user interface provided by the Element for executing preconfigured tests, and viewing results of the test.

SKA elements LMC GUIs



- ❑ SKA-TEL-TM-0000031, “SKA1 LMC Interface Guideline”, Rev 01

LMC Responsibilities

- Support features of TM defined UI by **providing the content/data**. The Element LMC exposes **API** that the TM can utilize to meet its data requirement. **Provide data** (in the form of monitoring points, SCM, alarms) that is displayed on the TM UI
- Create **Element specific UI elements/widgets** which comply with common UI standards and are rendered on to the TM UI
- Provide **API for TM to request Element specific UIs** which will be rendered by the TM on the operator console.
- Provide **UI for remote troubleshooting/diagnostics** of the Element, that can be launched from the TM
- Respond to **UI events/requests** coming from the TM UI
- Provide a **specific GUI for direct access** to monitoring data by external operators (engineers) in case of TM failure.
- Create **Custom visualization**.

SKA elements LMC GUIs



- ❑ SKA-TEL-TM-0000031, “SKA1 LMC Interface Guideline”, Rev 01

TM-LMC Interaction

For generic UI, the **TM fetches data from the Elements** and displays in a standard format (consistent for all Elements). TM acquires this data through a variety of mechanisms:

- ❑ Subscription to Element’s monitoring points
- ❑ Subscription to Events
- ❑ SCM published by each Element
- ❑ Issuing commands for specific data requests

TM enables to **launch Element specific UI/tools** for configuration, debugging, testing and diagnostics of Elements.

For specific UI (such as **Element visualization**), the TM provides the **UI container** and requests the Element LMC for the content.

TM listens to (user actions) and translates the action to a **request (command)** to specific Element LMCUI events to process/respond to the request.

DSH.LMC GUI specs



SKA-TEL-SKO-0000150, “SKA1-MID Interface Control Document TM To Dish” , Rev 02

Engineering interfaces are low-level control and monitoring interfaces that are used during the development of sub-elements. During the operational phase for fault finding, repair and upgrades, it may be useful to make these interfaces available remotely.

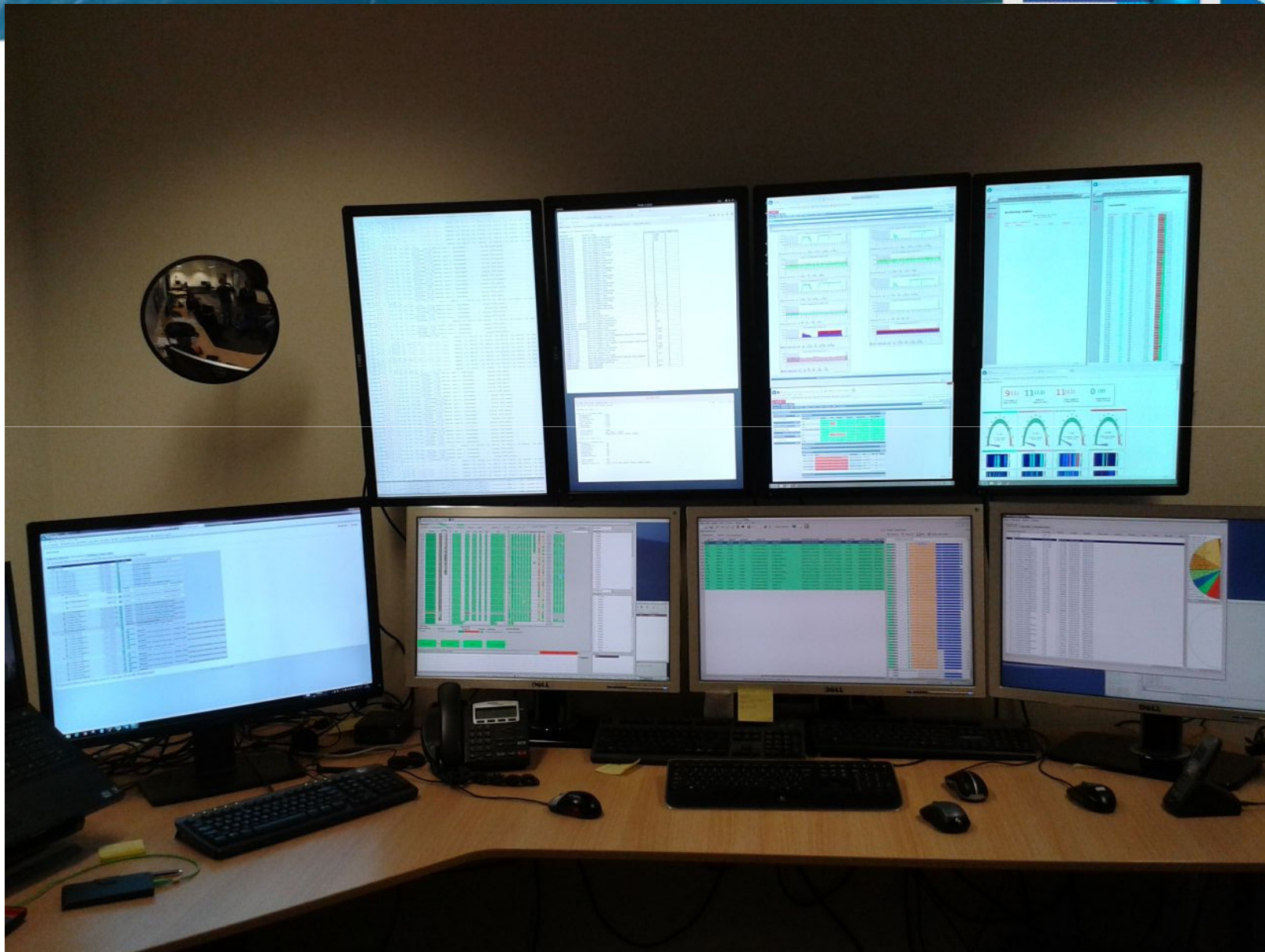
The TM shall provide a “**tunnelling**” capability to access engineering interfaces of sub-elements remotely.

SKA-TEL-DSH-0000016, “DISH LOCAL MONITORING & CONTROL REQUIREMENTS SPECIFICATION ” , Rev 03

LMC remote updates: LMC shall enable **patching and upgrade** of software and firmware remotely.

LMC tunneling capability: LMC shall provide a “**tunnelling**” capability to access engineering interfaces of sub-elements remotely.

LOFAR GUIs (credits to ASTRON - Netherlands Institute for Radio Astronomy)



LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



Hardware MCL001: LOFAR_PIC_Europe

Alarms: 0

Locator Ring

Observations

- planned
 - Observation433862
 - Observation433858
 - Observation433854
 - Observation433882
 - Observation433420
 - Observation433048
- active
 - Observation433058
- finished
 - Observation433054
 - Observation433890

Processes

- CS001
- CS002
- CS003
- CS004
- CS005
- CS006
- CS007
- CS011
- CS013
- CS017
- CS021
- CS024
- CS026
- CS028
- CS030
- CS031
- CS032
- CS101
- CS103
- CS301
- CS301
- CS302
- CS401
- CS501
- DES01

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



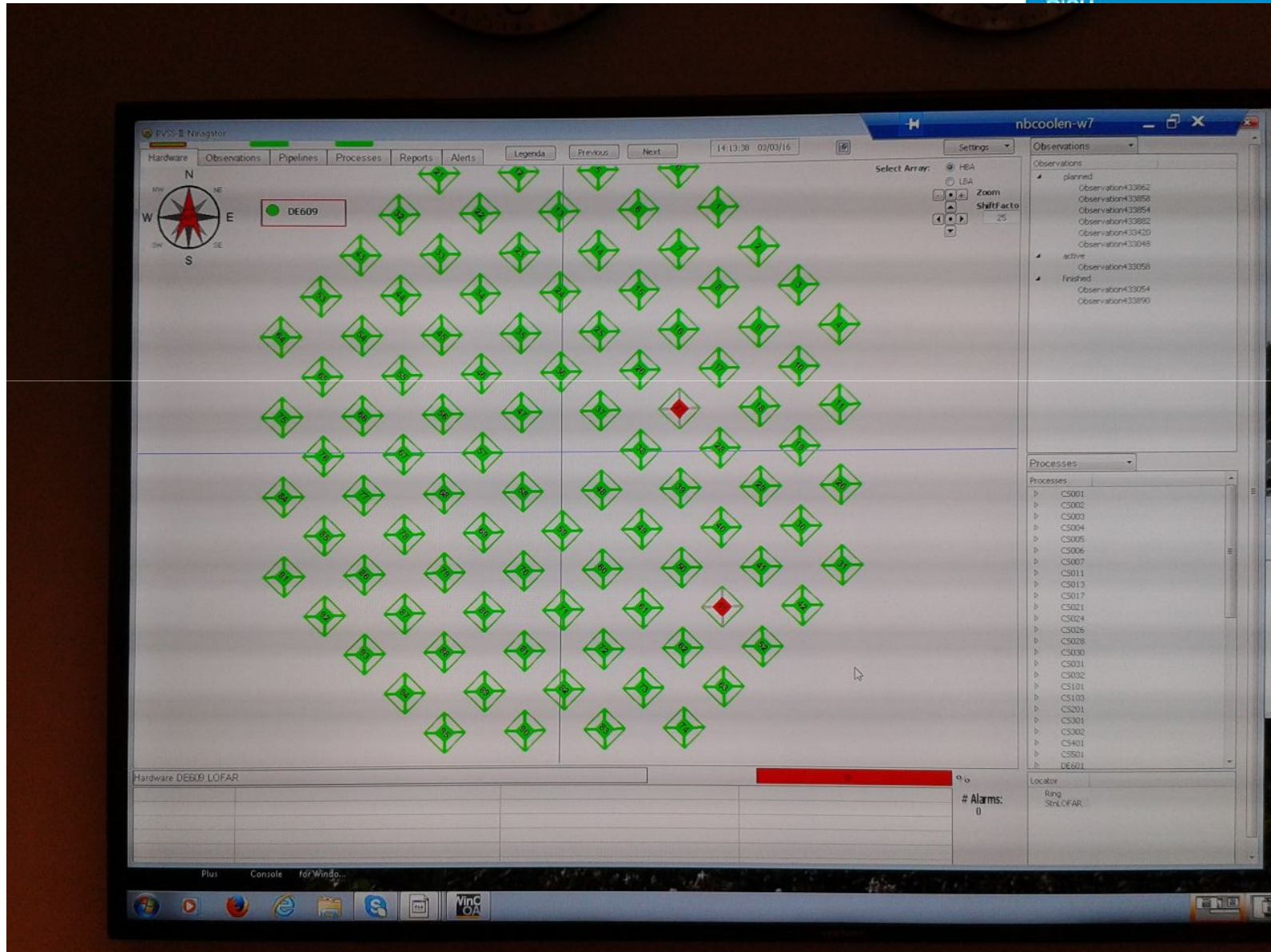
The screenshot displays the LOFAR Navigator software interface. The main window shows a satellite map of the LOFAR Core area, with several red circular markers indicating observation locations. The interface includes a menu bar with options like Hardware, Observations, Pipelines, Processes, Reports, Alerts, and a toolbar with buttons for Legend, Previous, Next, and Settings. The right-hand side features a panel for Observations, which is divided into 'planned' and 'finished' categories, listing specific observation IDs. Below this is a Processes panel with a list of process IDs (CS001 to CS501). At the bottom right, there is a section for Alarms, showing '# Alarms: 0' and a Locator Ring.

Observations
planned
Observation433862
Observation433856
Observation433854
Observation433882
Observation433420
Observation433048
active
finished
Observation433058
Observation433054
Observation433890

Processes
CS001
CS002
CS003
CS004
CS005
CS006
CS007
CS011
CS013
CS017
CS021
CS024
CS026
CS028
CS030
CS031
CS032
CS101
CS103
CS201
CS301
CS302
CS401
CS501

Alarms: 0

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



The screenshot displays the LOFAR Navigator software interface. The main window shows a grid of radio telescope antennas, with most represented by green diamond icons and two by red diamond icons. A compass rose is visible in the top left corner. The interface includes several panels:

- Hardware:** DE609 LOFAR
- Observations:** A list of observations categorized into planned, active, and finished. The active list includes Observation433058.
- Processes:** A list of processes, including CS001 through CS032, CS101 through CS103, CS201 through CS302, CS401, CS501, and DE601.
- Alarms:** # Alarms: 0
- Locator:** Ring: StnLOFAR

The bottom of the screen shows a Windows taskbar with various application icons and the system clock.

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



The screenshot displays the LOFAR Navigator software interface. At the top, there is a navigation bar with tabs for Hardware, Observations, Pipelines, Processes, Reports, and Alerts. A status bar shows the time 14:14:34 on 03/03/16. The main area features a rack of hardware with four cabinets labeled Cabinet: 0, Cabinet: 1, Cabinet: 2, and Cabinet: 2. Each cabinet contains subracks: Cabinet 0 has Subrack: 0 and Subrack: 1; Cabinet 1 has Subrack: 2 and Subrack: 3; Cabinet 2 has Subrack: 4 and Subrack: 5. To the right of the cabinets is a detailed view of a cabinet's internal components, including BB standard, GPS receiver, COU-1, and a LINE FILTER. Below the rack, there are four monitoring panels, each showing on/off status, temperature (Temp) at 26.8°C, humidity (Humidity) at 16.52%RH, and door control (DoorControl) status. The bottom of the interface includes a hardware identifier 'Hardware DE609 LOFAR_PIC', a red progress bar, and a '# Alarms: 0' indicator. A sidebar on the right contains sections for Observations, Processes, and Locator.

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)

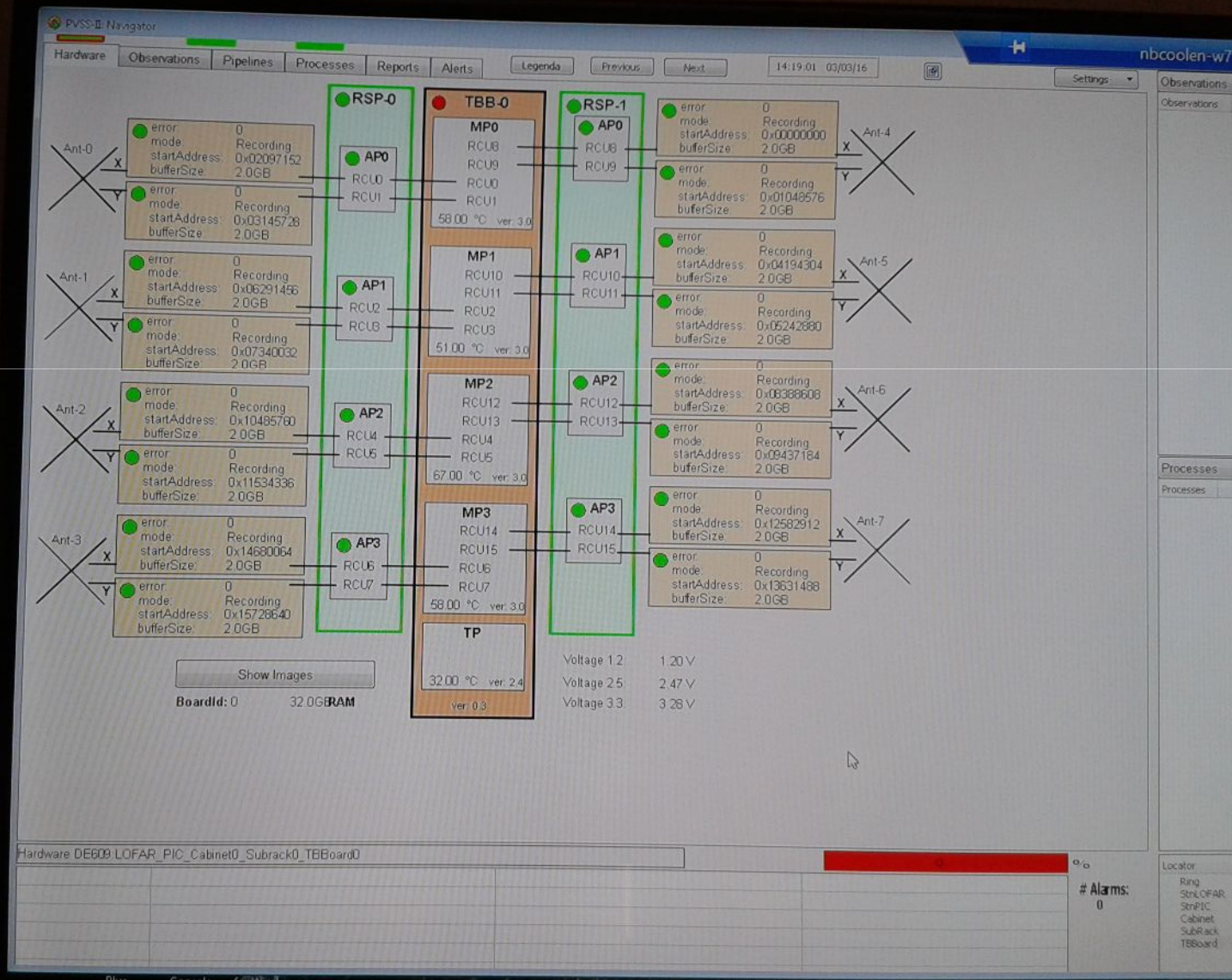


The screenshot shows the PVSS-II Navigator software interface. The main window displays hardware monitoring data for Station DE609, Cabinet 0, Subrack 0. The interface includes a menu bar (Hardware, Observations, Pipelines, Processes, Reports, Alerts), a status bar (14:18:36 03/03/16), and a settings dropdown. The hardware monitoring section is organized into several panels:

- Station Information:** Station: DE609, Cabinet: 0, Subrack: 0.
- TBBoard0 and TBBoard1:** Each board shows three voltage readings: Voltage 1.2 (1.20 V), Voltage 2.5 (2.47 V), and Voltage 3.3 (3.28 V). Both boards are at version 0.3.
- RSP 0, RSP 1, RSP 2, and RSP 3:** Each RSP unit shows three voltage readings: Voltage 1.2 (1.18 V), Voltage 2.5 (2.49 V), and Voltage 3.3 (3.20 V). All RSP units are at version 5.
- Clock Board:** Temperature: 26.00 °C, Frequency: 200 Mhz, Vfsp: 2.96 V, Clock: 4.95 V. It includes checkboxes for lock160 (unchecked) and lock200 (checked). Version: ver.xx.
- SPU Board:** Temperature: 30.00 °C, Voltage HBA: 44.86 V, Voltage LBA: 7.58 V, Voltage DIG: 4.74 V.

The interface also shows a status bar at the bottom with the text "Hardware DE609_LOFAR_PIC_Cabinet0_Subrack0" and a red bar indicating the number of alarms, which is 0.

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



PVSS-II: Navigator

Hardware Observations Pipelines Processes Reports Alerts

14:19:11 03/03/16

nbcooler

Ant-0 X Y

Ant-1 X Y

Ant-2 X Y

Ant-3 X Y

Ant-4 X Y

RSP-0 TBB-0 RSP-1

AP0 MPO AP0

RCU8 RCU9 RCU8 RCU9

RCU0 RCU1 RCU0 RCU1

error mode Recording startAddress bufferSize

0 0 0 0

0x02097162 0x03145729 0x06291456 0x07340032 0x10485760 0x11534336 0x14680064 0x15728640

2.0GB 2.0GB 2.0GB 2.0GB 2.0GB 2.0GB 2.0GB 2.0GB

57.00 °C ver. 3.0

Flash Images

Nr	version	Write Time	TP FileName	MP FileName
1	4.7	2014-Mar-25 11:14:28	tp18_11_hex	mp_lp2_2_hex
2	3.2	2015-May-05 14:06:11	tp18_11_hex	mp_36ht512_2d.h
3	free	---		
4	free	---		
5	free	---		
6	free	---		
7	free	---		
8	free	---		
9	free	---		
10	free	---		
11	free	---		
12	free	---		
13	free	---		
14	free	---		
15	free	---		

Show Image

BoardId: 0 32

Close Window

Hardware DE609 LOFAR_PIC_Cabinet0_Subrack0_TBBBoard0

Alarms: 0

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



View: DE609 LOFAR_PIC_Cabinet0_Subrack0_RSPBoard0

Station Clock: 200 Mhz

RCU	AP	Temp	Sample	Sync	Error	Ver
RCU0	AP0	45°C	-2113547264	-2113547264	0	8.2
RCU1	AP1	63°C	-2113547264	-2113547264	0	8.2
RCU2	AP2	60°C	-2113547264	-2113547264	0	8.2
RCU3	AP3	62°C	-2113547264	-2113547264	0	8.2

RSPBoard0

MEP	Ethernet
Seqm: 0	Packets received: 44215366
Error: 0	Packets error: 0
	Last error: 0
Voltage 1.2: 1.18 V	
Voltage 2.5: 2.49 V	
Voltage 3.3: 3.20 V	
Bitmode: 0	Bitmode Capability: 0

BP: 55°C (ver: 8.2)

Control (Ethernet) / Data output (Ethernet)

Hardware DE609 LOFAR_PIC_Cabinet0_Subrack0_RSPBoard0

Alarms: 0

Locator: Ring, StruCP, StruPIC, Cabinet, SubRa, RSPBo

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



PVSS-II Navigator | nbcoolen- | 14:22:09 03/03/16

Hardware Observations Pipelines Processes Reports Alerts Legend Previous Next

RCU0

● LBL ● LBH ● Show HBA Antenna

X X X

Lowband High Antenna

● LBARReceiver

Lowband filter
30-90 MHz

● HBARReceiver

Highband filter
110-190 MHz

HighBand Antenna

Attenuation 7.25 dB

● ADC

nr of overflows
0

Delay 190.00 ns

Backplane

TBB info

error	0
mode	Recording
startAddress	0x02097152
bufferSize	2.0GB

Trigger info

startlevel	0
baselevel	2047
stoplevel	0
filter	0
trigger mode	Local One Shot
operating mode	Transient detection
window	0
filter0:	
coeff0	0
coeff1	0
coeff2	0
coeff3	0
filter1:	
coeff0	0
coeff1	0
coeff2	0
coeff3	0

Hardware DE609 LOFAR_PIC_Cabinet0_Subrack0_RSPBoard0_RCU0

Alarms: 0

LOFAR Navigator (credits to ASTRON - Netherlands Institute for Radio Astronomy)



arms:

Locator	
Ring	
StnLOFAR	
StnPIC	
Cabinet	
SubRack	
RSPBoard	
RCU	



Which GUIs for whom:

Engineering interfaces (engineers for test, diagnostic, maintenance of DSH sub-elements)

Navigation interface (control room operator for operations purposes)

TM defines a coherent purpose, method, and look-and-feel for the UI.

TM provides:

- the framework** to support UI development.
- A common **GUI platform** which serves as a **common portal** for access to TM interfaces, and which enables interactions among UIs such as cut-and-paste and coordinated visualization.
- A **library of interface elements**, including visualizations, notifications and interface templates.
- Common guidelines** for user interface design.
- A **common development environment**, with associated **deployment and verification** processes.
- TM UI** provides features such as **drilldown, co-ordinated navigation, and navigation to other UIs**, configurability which will require support from the Element. UI also support **20 authorization and authentication**



LMC team activities:

Requirements refinement

Usage Centered Design (users, tasks, interactions, look and feel) according to TM guidelines and UI framework

Prototyping

TM integration