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R2CP.ETH SYSTEM MESSAGES - MESSAGE DESCRIPTION

Software Protocol Specification

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Table of Updates

Revision	Date	Changes / Remarks	Affected Sections	Author
v1.0.2		First version		Jesús Albendea
V1.0.3	05/05/15	System message includes issuing device and a bigger field for ID.	Chapter 11.1	Jesús Albendea
V1.0.4	21/05/15	Added inhibit RX and movement phase	Chapter 11.1	Jesús Albendea
		Added examples of use	Chapter 11.2	Jesús Albendea
V1.0.5	20/07/15	Added new data fields for additional information to a System Message	Chapter 11.1.1	Jesús Albendea
V1.0.6	07/10/15	Added CP codes to SET & GET messages		
V1.0.7	07/04/16	Clear message conditions: Clear by source device renamed as Clear by qualified device	Chapter 4.2	Jesús Albendea
V1.0.8 RevA	06/07/16	Clear message conditions: Clear by qualified device split into Clear by issuing device and Clear by Main Console	Chapter 4.2	Jesús Albendea
	03/04/17	Add id system message range defined	Chapter 2	Jose Antonio González
V1.0.9 RevB	22/11/18	Change format to section tiltes	All	Lucía Maté
		Same System message codes for SHFR and SHFM generator	Chapter 1	Lucía Maté
V1.0.10 RevC	08/02/19	System Message attributes redefined		Jesús Albendea

	25/11/20	Added Lights and Sounds messages	9.1.2 9.1.3	Jesús Albendea
	25/10/21	Include more explaining information about lights	9.1.2	Lucía Maté

Table of Updates

1. INTRODUCTION

This document describes how exposure inhibits, movement inhibits, errors, warning, notifications are handled on the system by using System Messages.

How to handle a System Message can be split into two categories:

- Handling in the GUI
- Handling by the devices.

Compatibility table

Document Revision	A	B
Date	6/04/17	27/01/18
Protocol Version	1.0.8	1.0.9

2. System Message Configuration

The System Messages (SM's) are defined by the following parameters:

- ID
- Description
- Device that issues the SM: Generator / Positioner / Imaging SW / Console
- Device that clears the SM: Generator / Positioner / Imaging SW / Console
- How SM is cleared
- Basic behaviour
- Device specific behaviour
- Miscellaneous

2.1 ID

All system messages will have a unique Message ID.

The ID's are reserved as follows:

- From 100.000 to 109.999: SHFR Generator..
- From 200.000 to 289.999: ChallengeX.
- From 290.000 to 299.999: Mobile IV.
- From 300.000 to 399.999: Console.
- From 500.000 to 599.999: Imaging system.

2.2 Description

Contains the description of the SM that can eventually be displayed to the user.

2.3 Device that issues the SM

Defines the device that sends the SM.

2.4 Device that clears the SM

Defines the devices that can clear the SM.

The information about the devices that issues and clears the SM is used to restrict the device that can clear it. For instance, if generator sends a door open SM, only the generator can clear it.

2.5 How SM is cleared

- **After display**: Device that issues the SM will send it and dismiss it. When SM is displayed to the user, it is cleared. **(clear after display)**
- **After user confirmation**: Issuing device will keep a queue of its active SM's. SM will be removed from the queue after being individually confirmed in the GUI. **(clear by operator)**
    - Options
        - Modal popup
            - Text in close button: "OK", "Cancel", …
        - Countdoun
- **When conditions are met** Issuing device will clear it when the conditions to activate it disappear. Door open falls in this type, when door closes generator will clear the SM. **(clear by device)**:
    - Options
        - Modal popup
            - Close button
                - Text

2.6 Basic behaviour

Defines regular behavior common to all devices and applications.

Warning: Message that draws user attention, but does not disable or abort exposures. For instance, when we are increasing kVp and maximum value is reached. A blinking message is displayed to the user for a few seconds notifying this event.

- **Information:** Relevant information to the user.
- **User action required**: For instance, when grid is needed for a procedure.

- **Xray inhibit + phase**: An xray inhibit is anything that prevents generator from making exposures: generator error, positioner error, tube and image receptor not aligned. Generator phase defines where the inhibit is applicable from. If specified phase is Standby, generator will not prep when handswitch/footswitch is pressed. If phase is Ready, generator will prep when handswitch/footswitch is pressed, but will not start radiation. It can be used to overlap parts of the sequence during stitching and minimize total procedure time.
- **Motion inhibit**
- **Error**

2.7 Device specific behaviour

In this category we define particular handling of the SM by a device or for a certain custom application.

- **Generator**
  - **Release handswitch:** If door is open, generator will send an SM with xray inhibit configured with release handswitch = ON. If door closes and handswitch is pressed, generator will wait for the user to release the handswitch and will send a new SM with User action required = YES asking the user to release it. This would apply to all xray inhibits to prevent unintended exposures.
  - **Abort Exposure**: If it can occur during an exposure and will prematurely finalize it. With this property, an event that inhibits exposures can be configured to abort current exposure or not.
  - **Reboot**
- **Positioner**
  - **Reset after a specified time:** UMC error reset in ChallengeX from Master, errors are reset after 5 seconds.

2.8 Icon

Defines the icon to be displayed along with the message description.

ICON	CATEGORY
	WARNING
	ERROR

	EMERGENCY BUTTON
	INFORMATION
	INHIBIT
	USER ACTION REQUIRED

2.9 Miscellaneous

Attributes related to the way SM are handled by the GUI and by the positioner for visual indications to the user.

- History: Determines if SM is kept in SM history.
- Message bar display: Defines if SM is displayed in the bottom message bar.
- Sound: Defines sound.
- Leds: Defines how SM is displayed in the status leds.

3. SYSTEM MESSAGE DATABASE

System messages are stored in an internal database (http://wsoft.sedecal.com:8091), and exported in a local file system_messages.sqlite. This file ca be viewed by a free viewer DB Browser for SQLite (https://sqlitebrowser.org/)

DESCRIBIR cómo se guardan los System Messages en bases de datos. INFORMACION DE UNA PRESENTACION:

- System message ID's and parameters are held in a database shared by all the devices.
  - Positioner: Uses global DB.
    - Uses information of their own SM's
    - Uses information of the rest of SM's in what relates to status lights and sounds.
  - Console on tube head / Imaging SW – console part: It implements GUI management of SM's. Uses global DB.
  - Imaging SW – imaging part: Uses Imaging SW related SM's for behaviour.
    -

- Generator
  - Uses generator related SM's for behaviour.
  - Receives through R2CP SM SET including the information needed for management.

There will be a table with the description of each message ID for the selected language. Additionally, there can be Help Text and Help Picture associated per ID.

ID	1428
Description	Detector emergency button engaged. Release to continue operation.
Help Text	Detector emergency button engaged. Twist to release and continue operation. First, make sure all safety conditions are met.
Help Picture	Path to help picture showing where the emergency button is located.

Sometimes some additional information is displayed. Nature will be dependent on the system message:

ID	1355
Description	Autocalibration in progress for:
Help Text	Values to be displayed are: {0}, {1}, {2}
Help Picture	
Numeric Information Field 1	value
Numeric Information Field 2	Value
Numeric Information Field 3	Value

Generator during autocalibration procedure will send messages with additional information fields to let user know the kVp and mA combination being calibrated

The following parameters define the nature and handling of each specific Message ID.

All parameters will be held on the same database. However there can be parameters only useful for display purposes, or for handling by a specific device.

4. Examples of use

5. SYSTEM MESSAGE QUEUE

All nodes that can issue a system message will keep a queue of active messages. Console will display only those messages for the active nodes identified by the selected workstation.

A plain warning message that is displayed for a few seconds is not kept in any queue.

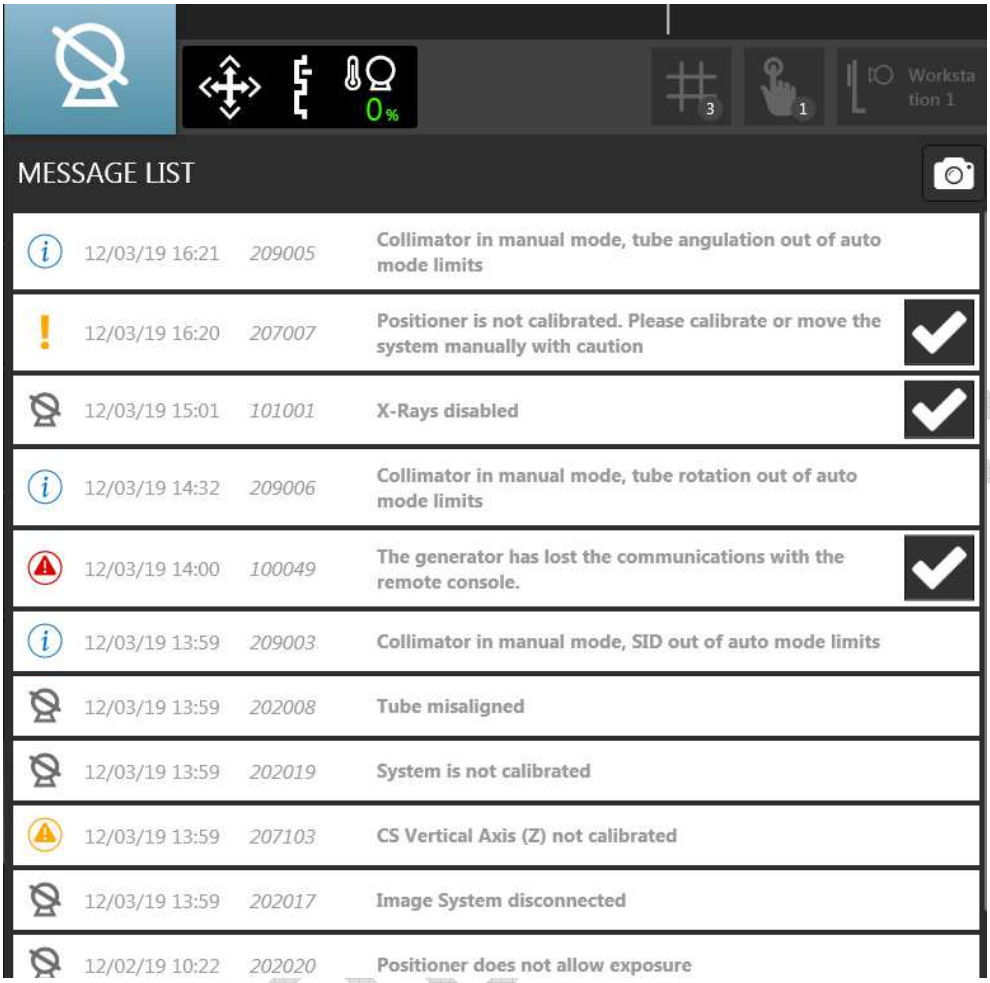
Each workstation selects a generator and a positioner. Only messages originated by the active generator and positioner will be displayed.

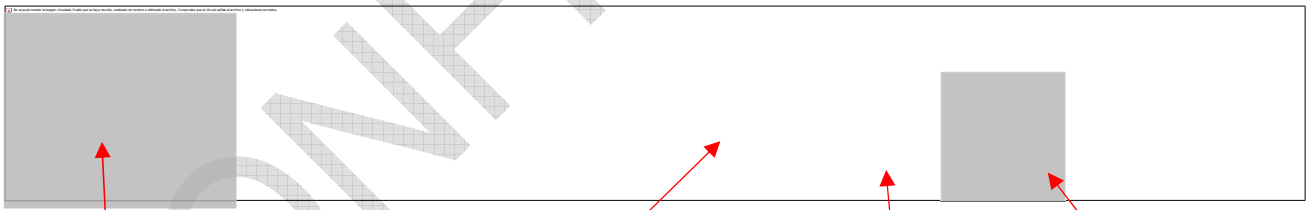
There are system messages that can come from the acquisition console, which are independent of the selected workstation.

6. MAIN ICONS

All system messages set with the “log” property to “True”, are displayed in the message history box.

The status of the system message is reflected on the system status bar





Displayed when there is at least a System Message active with Inhibit Request set to true

Displayed when there is at least a System Message active with Bootup property set to true

Displayed when there is at least a System Message active with Collimator property set to true

Displayed when there is at least a System Message active with User Action Request set

7. INHIBITS AND STATUS/PHASE

Positioner and Acquisition System can request generator not to expose because of many reasons: tube not pointing to detector, acquisition workstation not ready, panel not ready, positioner moving and collimator blades moving, among others.

There can be more than one inhibit active at a time, for instance positioner moving and collimator blades moving. There can be several inhibits active coming from different subsystems simultaneously.

There are also some inhibits that can be originated in the generator like door open, no HU available for the selected exposure parameters, tube rating exceeded. Those inhibits will be sent to the rest of the system for information and display purposes.

An important parameter to inhibit definition is phase (generator status & positioner status). It indicates in the normal sequence of an exposure, where the inhibit applies. Door open is an inhibit that applies from standby. If door is open, preparation is not allowed. If generator is ready and door opens, generator should go back to standby. If generator is exposing and door opens, generator should abort the exposure and go to standby.

For inhibits issued from the acquisition system or positioner, phase can help overlap actions during special procedures that require synchronization of many subsystems. After an exposure during stitching, positioner should move to next position and acquisition SW should select exposure parameters, prepare panel … Positioner will send an inhibit that will affect only to ready phase, allowing the generator to prep but not to expose.

8. SAFETY

File that contains error description and configuration should not be easily accesible to users. File could only be edited by authorized personnel through a specific tool.

9. R2CP PROTOCOL

As defined in R2CP protocol, the following functions are paired

- SET – EVENT
- GET – ANSWER

EVENT can be sent asynchronously.

9.1 Message Definition

9.1.1 System Messages

9.1.1.1 System Message Definition

SUBINDEX: 1

SET / ANSWER - EVENT

BYTE	DATA	FORMAT
1	Issuing Node Number	1..255
2, 3, 4, 5	ID	
6	Status	0 – Not active 1 – Active
7	Inhibit RX	0 – Does not inhibit exposure 1 – Inhibit exposures
8	Inhibit Generator Status/Phase	1 – Initialization **2 – Standby** 3 – Preparation **4 – Ready** 5 – Exposure in Progress 9 – Error 10 – Service
9	Inhibit Movement	0 – Does not inhibit movement 1 – Inhibit movement
10	Inhibit Positioner Status/Phase	

11	#of codes for additional information	0..255
12	#of bytes for additional information code 1	1..4
13 (*)	Additional information code 1	
14 (*)	#of bytes for additional information code 1	1..4
15 (*)	Second additional information code 2	
…..	…..	

(*) Index dependent on the additional information codes data length.

GET

BYTE	DATA	FORMAT
1, 2, 3, 4	ID	

COMMAND PROCESSED FUNCTION RETURN CODES

SET

BYTE	DATA	FORMAT
1	SEQ Number for the SET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

GET

BYTE	DATA	FORMAT
1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

DESCRIPTION

Message to indicate when a System Message is active or cleared. It can also request to reset it.

System message additional information can be used to specify the root cause when it is relevant for the user to know. For instance, if we have defined Procedure 1 with two RAD DB's and DB 2 / Sequence Number 2 settings result in an AEC selection error, it will send the following System Message:

BYTE	DATA	FORMAT
1	Issuing Node Number	1 (assuming generator is NN=1)
2, 3, 4, 5	ID	XXXXXX
6	Status	1 – Active
7	Inhibit RX	1 – Inhibit exposures
8	Inhibit Generator Status/Phase	2 – Standby
9	Inhibit Movement	0 – Does not inhibit movement

10	Inhibit Positioner Status/Phase	N/A
11	#Number of codes for additional information	3
12	#of bytes for additional information code 1	1
13	Additional information code 1	1 (Procedure)
14	#of bytes for additional information code 2	1
15	Additional information code 2	2 (Sequence number)
16	#of bytes for additional information code 3	1..4
17	Additional information code 3	2 (DB=2)

9.1.1.2 Request All System Messages

SUBINDEX: 2

GET

No data.

COMMAND PROCESSED FUNCTION RETURN CODES

GET

BYTE	DATA	FORMAT
1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

DESCRIPTION

Used to request all active System Messages to a node. Node will send a System Message ANSWER per active message.

9.1.2 Lights

- Ligths are classified in two categories:

Exposure lights:

Managed internally by the system

Have priority over the other lights

Status:

Prepared for exposure (ready state)

Exposure in progres

External lights.

Can by managed by the image system (See remote Management message)

- Lighs are defined using the following characterstics. These characteristics will be defined in an external table.

ID: Light Identifier Code

RGB: RGB Code

Time ON: number of milliseconds that light is turned on.

Time OFF: number of milliseconds that light is turned off.

Number of beeps: number of repetitions within one period

Period time: Interval where time On – time off sequence is repeated

Number of periods: number of repetitions for period configuration. If value is 0xFF light is ON until powered off.

Example:

	ID	RGB	Time ON	Time OFF	Number of beeps	Period time	Number of periods	
Prepared for exposure	1	Green	1000	0	1	1000	0xFF	Always green
Exposure in progress	2	Yellow	1000	0	1	1000	0xFF	Always yellow
External Light	3	Cyan	500	1500	1	2000	0xFF	Cyan blinking always
External Light	4	Cyan	1000	0	1	1000	0xFF	Always cyan always

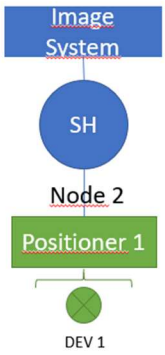
External Light	5	White	250	250	2	2000	0xFF	White fast blinking within 1 sec 1 sec off, always
External Light	6	Orange	250	250	2	2000	2	Orange fast blinking within 1 sec 1 sec off, 2 times
External Light	9	RGB1	…					
External Light	10	RGB2	…					
External Light	11	RGB3	…					
External Light	12	RGB4						

The light characteristics for each code, can be customized for every system.

How to activate lights. Use of Remote Management Message.

- Image system will send a R2CP SET indicating for each device, the new status light. If status remains, does not need to include it on the message.

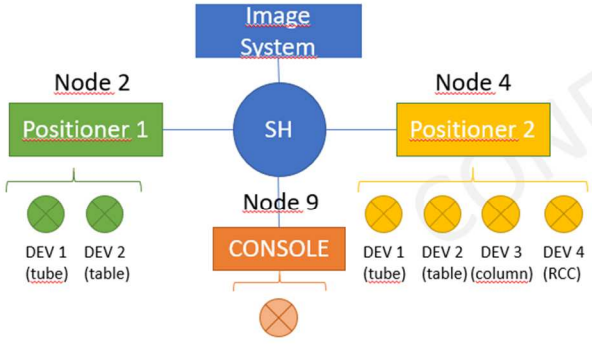
In case of only one light management:



External Light SET	Node ID 2
Nº of LEDs modified	1
LED Id	1
Light Id code	4 (on)

External Light SET	Node ID 2
Nº of LEDs modified	1
LED Id	1
Light Id code	0 (off)

In case of several light management:



GENERIC R2CP SYSTEM

External Light SET	Node ID 2
Nº of LEDs modified	2
LED Id	1
Light Id code	0 (off)
LED Id	2
Light Id code	0 (off)

External Light SET	Node ID 4
Nº of LEDs modified	3
LED Id	1
Light Id code	5 (on)
LED Id	2
Light Id code	6 (on)
LED Id	3
Light Id code	0 (off)

External Light SET	Node ID 9
Nº of LEDs modified	1
LED Id	1
Light Id code	4 (on)

9.1.2.1 Remote Management

SUBINDEX: 10

SET / ANSWER - EVENT

BYTE	DATA	FORMAT
1	Management Mode	0 Local management 1 Remote management
2	Remote Management Node	0..255

Management Node

0: Lights will be managed by internally. Default setting.

1: Lights will be managed by an external device (ie. Image system).

Remote Management Node:

Node id that has lights.

GET

No data.

COMMAND PROCESSED FUNCTION RETURN CODES

SET

BYTE	DATA	FORMAT
1	SEQ Number for the SET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

GET

BYTE	DATA	FORMAT
1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

DESCRIPTION

Message sent to a node with light management capabilities to define if lights are managed with logic implemented by the node or by an external node.

9.1.2.2 Turn ON/OFF

SUBINDEX: 11

SET / ANSWER - EVENT

BYTE	DATA	FORMAT
1	Number of LIGHT Status Monitors to Update	1 .. 255
2	Monitor ID 1	1 .. 255
3	LIGHT ID 1	0 .. 255

Number of Light Status Monitors:

Indicate how many lights will be modified within the message. Since one device can manage more than one light at a time, the length of this message is not fixed,

Length = NofLightMonitors x 2 bytes

See Table 1 Light Messsage example.

Monitor ID:

Light device to be modified

Light ID:

Light code to be set. Light ID = 0 means light off.

In case of one positioner/light:

BYTE	DATA	FORMAT
1	Number of LIGHT Status Monitors to Update	1
2	Monitor ID 1	1
3	LIGHT ID 1	0 .. 255

GET

No data.

COMMAND PROCESSED FUNCTION RETURN CODES

SET

BYTE	DATA	FORMAT
1	SEQ Number for the SET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

GET

BYTE	DATA	FORMAT
1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

DESCRIPTION

Message sent to a node with light management capabilities to define the lights implemented by the light monitors controlled by the node. Light ID = 0 means lights off.

Example of use for a ceiling suspension master that controls light monitors on OTC, TABLE, WALLSTAND and RCC:

BYTE	DATA	FORMAT
1	Number of LIGHT Status Monitors to Update	4
2	Monitor ID 1	1 (OTC)
3	LIGHT ID 1	3 (CYAN)
4	Monitor ID 2	2 (TABLE)
5	LIGHT ID 2	0 (OFF)
6	Monitor ID 3	3 (WALLSTAND)
7	LIGHT ID 3	3 (CYAN)
8	Monitor ID 4	4 (RCC)
9	LIGHT ID 4	3 (CYAN)

Table 1 Light Messsage example

9.1.3 Sounds

Similar concept to lights. (see section Lights)

9.1.3.1 Remote Management

SUBINDEX: 20

SET / ANSWER - EVENT

BYTE	DATA	FORMAT
1	Management Mode	0 Local management 1 Remote management
2	Remote Management Node	0..255

GET

No data.

COMMAND PROCESSED FUNCTION RETURN CODES

SET

BYTE	DATA	FORMAT
1	SEQ Number for the SET request	1 .. 255
2	Return Code	RETURN CODES: 1 OK

GET

BYTE	DATA	FORMAT

1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 1 OK

DESCRIPTION

Message sent to a node with sound management capabilities to define if sounds are managed with logic implemented by the node or by an external node.

9.1.3.2 Turn ON/OFF

SUBINDEX: 21

SET / ANSWER - EVENT

BYTE	DATA	FORMAT
1	Number of SOUND Monitors to Update	1 .. 255
2	Monitor ID 1	1 .. 255
3	SOUND ID 1	0 .. 255

GET

No data.

COMMAND PROCESSED FUNCTION RETURN CODES

SET

BYTE	DATA	FORMAT
1	SEQ Number for the SET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

GET

BYTE	DATA	FORMAT
1	SEQ Number for the GET request	1 .. 255
2	Return Code	RETURN CODES: 0 OK

DESCRIPTION

Message sent to a node with sound management capabilities to define the sounds implemented by the sound monitors controlled by the node. Sound ID = 0 means sounds off.

Example of use for a ceiling suspension master that controls sound monitors on OTC and RCC:

BYTE	DATA	FORMAT
1	Number of LIGHT Status	2

	Monitors to Update	
2	Monitor ID 1	1 (OTC)
3	SOUND ID 1	7 (Positioner moving)
4	Monitor ID 2	2 (RCC)
5	LIGHT ID 2	0 (OFF)

10. Examples of use

In this paragraph we describe how some typical system messages can be handled with this new definition.

We focus on the main attributes that define how system messages are handled:

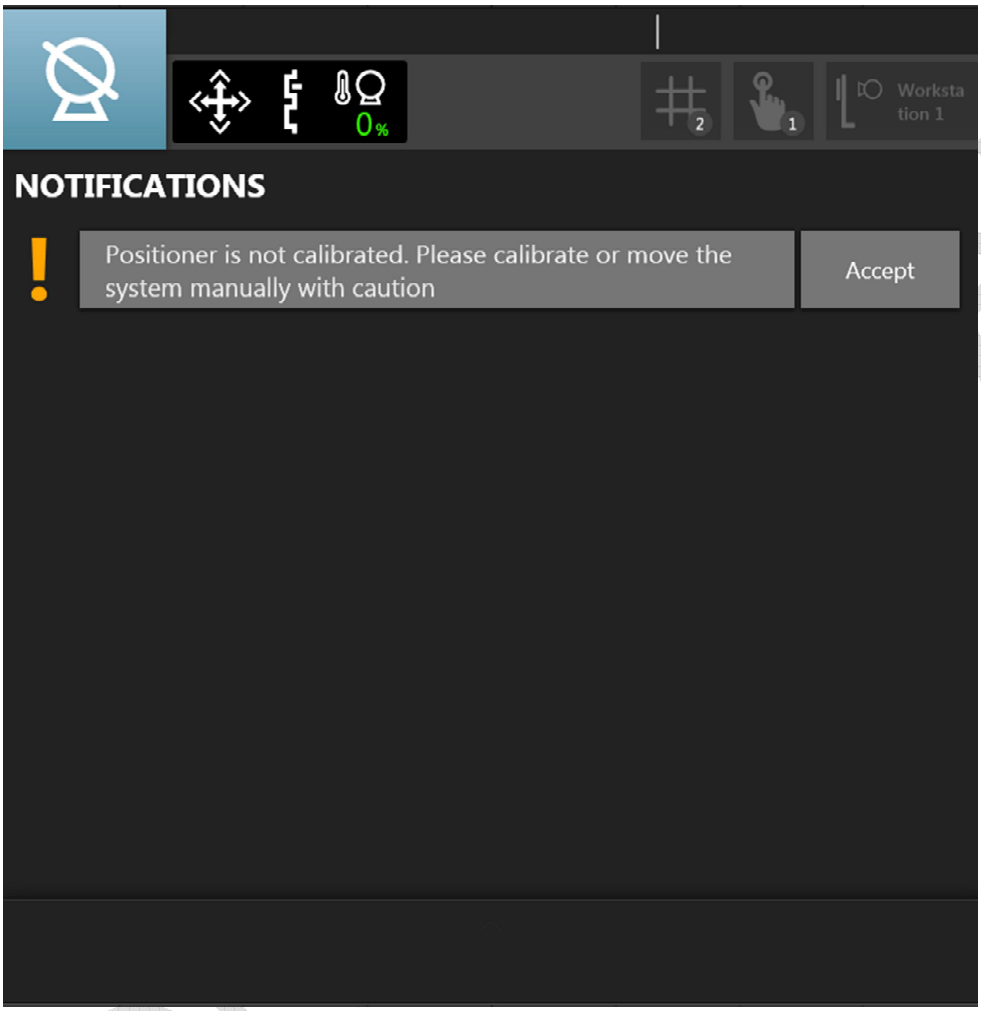
Device that issues the SM			
Device that clears the SM			
How SM is cleared	After display		
	After user confirmation		
	When conditions are met		
Basic behaviour	Warning		
	Information		
	User action required		
	Xray inhibit + phase		
	Motion inhibit		
	Error		
Icon			
Device specific behaviour	Generator	Release handswitch	

		Abort exposure	
		Reboot	

10.1 Exposure with AEC terminated by backup timer.

Device that issues the SM			Generator
Device that clears the SM			Generator
How SM is cleared	After display		No
	After user confirmation	Option: Modal popup Text in close button: “OK”	Yes
	When conditions are met		NO
Basic behaviour	Warning		No
	Information		No
	User action required		No
	Xray inhibit + phase		Yes + Standby
	Motion inhibit		No
	Error		Yes
Icon			Error
Device specific behaviour	Generator	Release handswitch	Yes
		Abort exposure	No
		Reboot	No

Generator will keep the error until it is reset by the user by pressing the console OK button.



10.2 Door Open

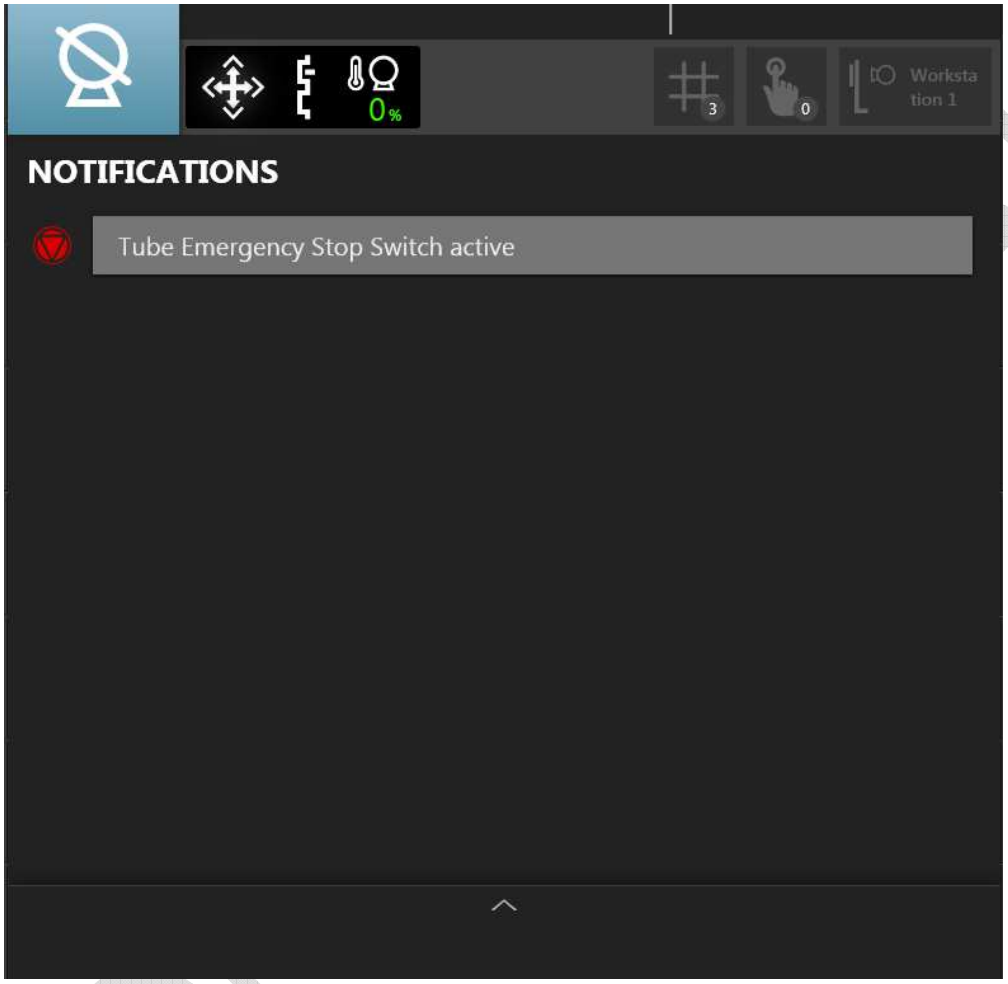
Device that issues the SM			Generator
Device that clears the SM			Generator
How SM is cleared	After display		No
	After user confirmation		No
	When conditions are met		Yes
Basic behaviour	Warning		No
	Information		No
	User action required		No
	Xray inhibit + phase		Yes + Standby
	Motion inhibit		No
	Error		No
Icon			
Device specific behaviour	Generator	Release handswitch	Yes
		Abort exposure	Yes/No
		Reboot	No

Door open inhibit can be configured either to abort an exposure or only to inhibit exposures.

10.3 Emergency button engaged

Device that issues the SM			Positioner
Device that clears the SM			Positioner
How SM is cleared	After display		No
	After user confirmation		No
	When conditions are met	Option: Modal popup	Yes
Basic behaviour	Warning		No
	Information		No
	User action required		No
	Xray inhibit + phase		Yes + Standby
	Motion inhibit		Yes
	Error		No
Icon			Emergency
Device specific behaviour	Generator	Release handswitch	Yes
		Abort exposure	Yes
		Reboot	No

When any emergency button is pressed, no movements or exposures are allowed. Modal popup window will be shown until emergency button is released (cleared by issuing device).



10.4 Warning message while changing exposure parameters.

Device that issues the SM			Generator
Device that clears the SM			N/A
How SM is cleared	After display		Yes
	After user confirmation		No
	When conditions are met		No
Basic behaviour	Warning		Yes
	Information		No
	User action required		No
	Xray inhibit + phase		No
	Motion inhibit		No
	Error		No
Icon			Warning
Device specific behaviour	Generator	Release handswitch	No
		Abort exposure	No
		Reboot	No

While user is changing exposure parameters, it can reach combinations that are not allowed by the generator or the tube. In the picture below, when trying to increase mA with low kVp, some tubes can have space chage and will require to increase kVp to a minimum value. Warning in this case will tell user that kVp should be increased to be able to increase mA.

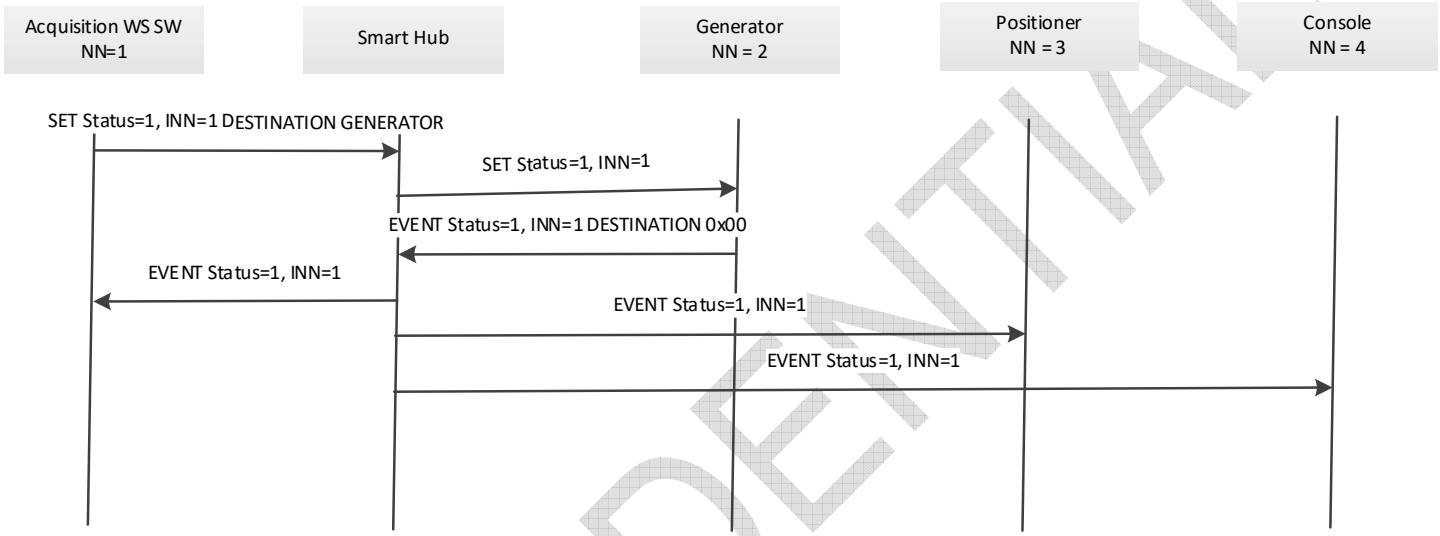
10.5 Inhibit RX

System Messages that inhibit exposures can be sent to the generator from different nodes or can be issued by the generator when it encounters an error or when there is an event that prevents exposures (door open, AEC error, ….).

10.6 Inhibit issued by the Acquisition Workstation SW

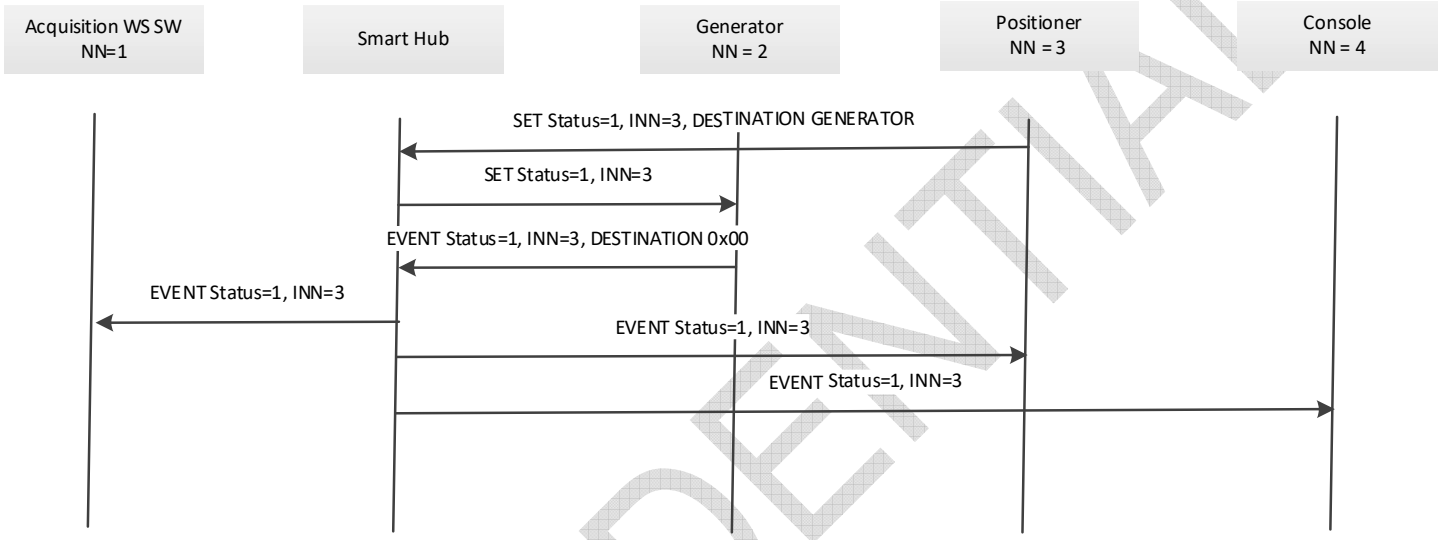
Usually this type of RX Inhibit is sent by the acquisition Workstation when patient is closed or when there is no procedure selected. No reset if possible.

System Message is sent to generator directly.



10.7 Inhibit issued by the Positioner

HW BUS provides a signal (POSITIONER OK) that prevents exposures when positioner is not ready. Generator will use this signal also not to initiate an exposure sequence when positioner is not ready. Inhibit through R2CP messages is not strictly necessary.



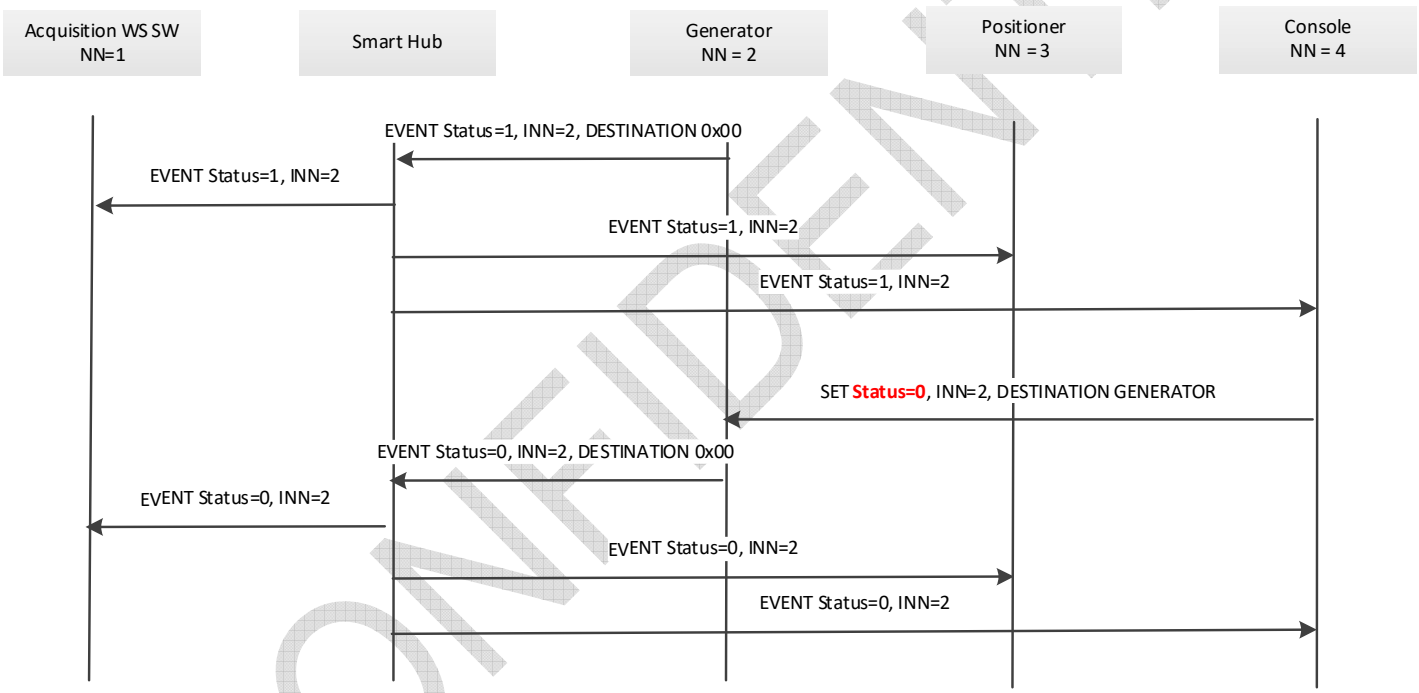
Selected workstation contains generator node number and positioner node number. Positioner can use this information to address inhibit to proper destination node

10.8 Inhibit issued by the Generator

Generator can inhibit exposures due to many reasons.

- Technique overload: current exposure parameters exceed remaining anode HU% left: inhibit will be removed by the generator when tube cools down.
- Exposure with AEC ended by backup timer: user has to acknowledge error (reset).
- Door open: inhibit will be active until door is closed.

Following sequence diagram describes inhibit similar to AEC error.

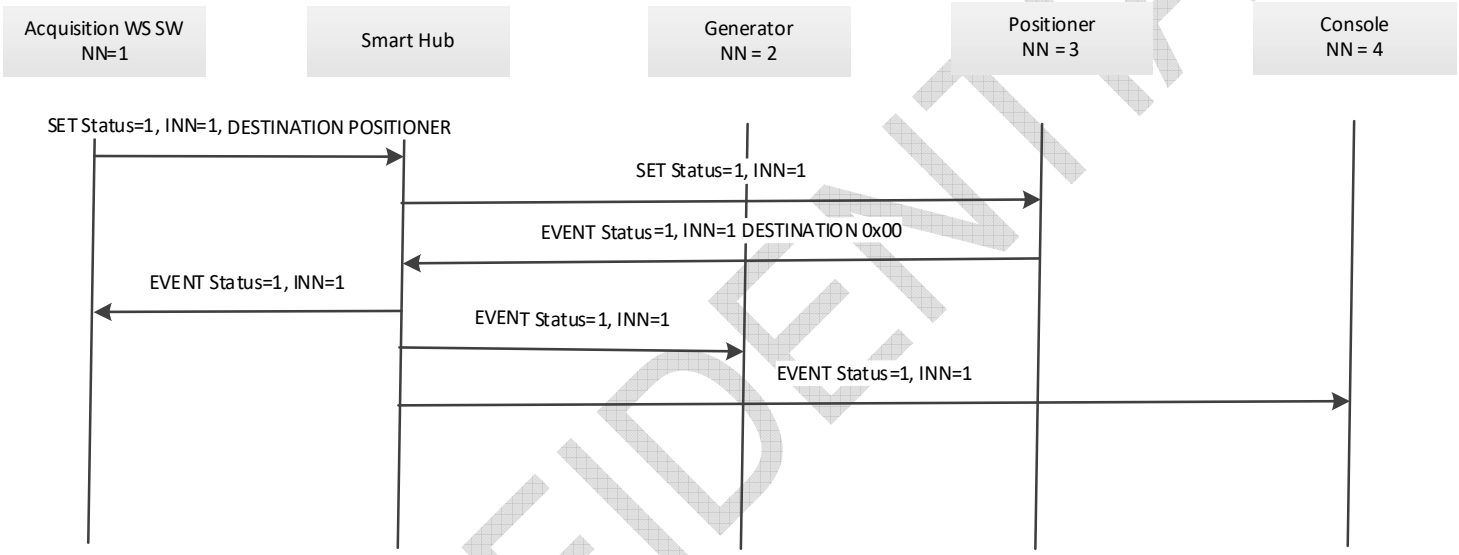


10.9 Inhibit Movement

10.9.1 Inhibit issued by the Acquisition Workstation SW

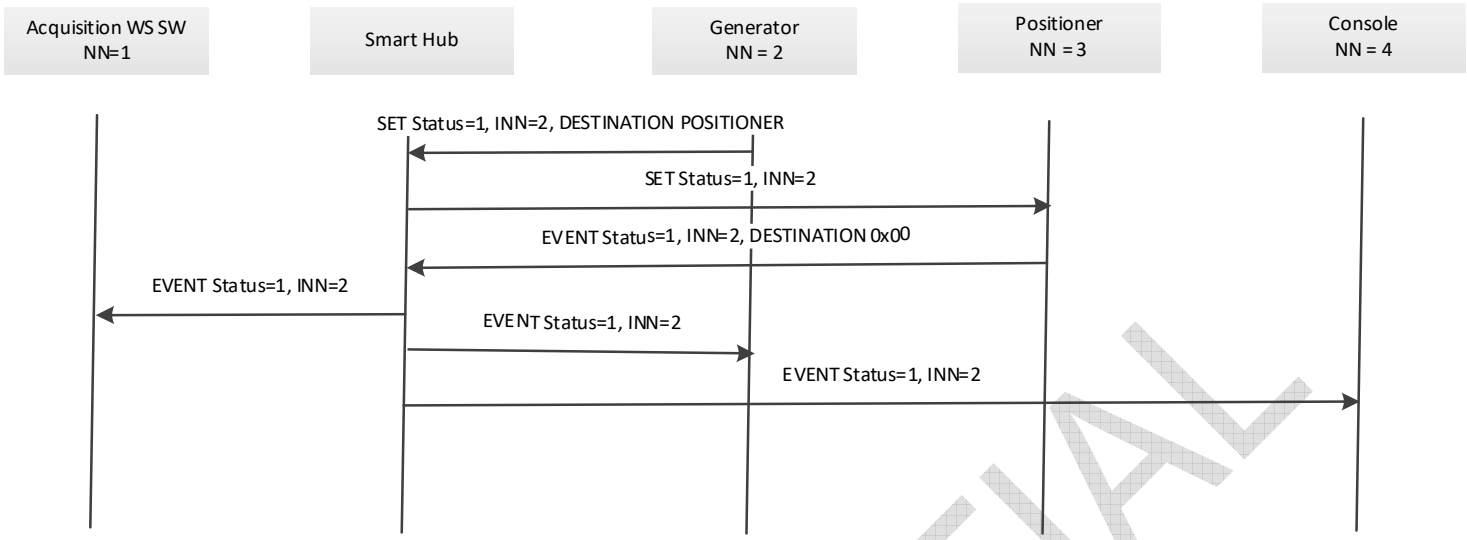
Usually this type of Movement Inhibit is sent by the acquisition Workstation. No reset if possible.

System Message is sent to positioner directly.



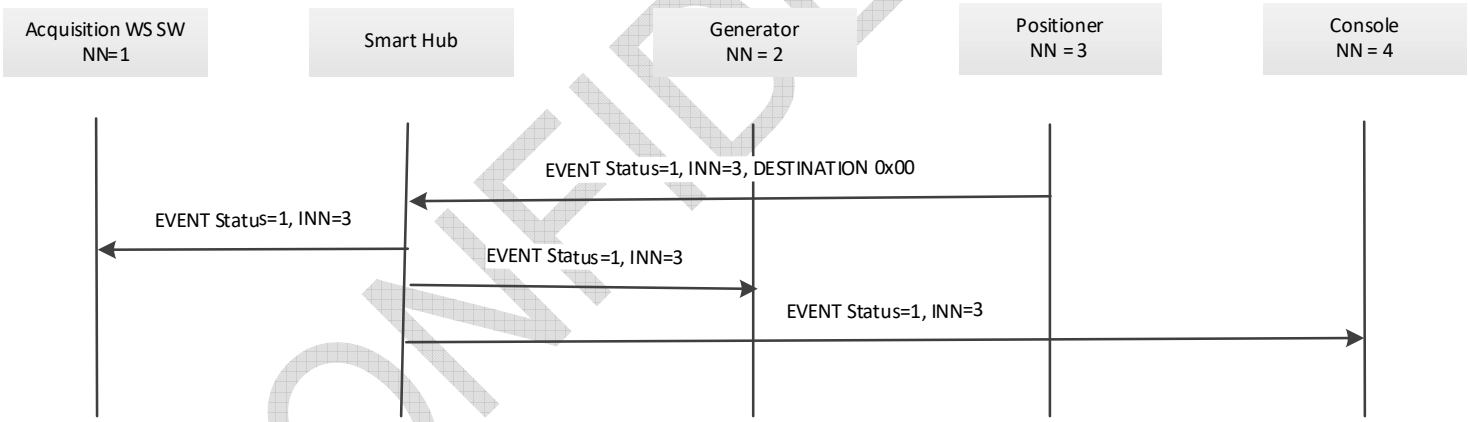
10.9.2 Inhibit issued by the Generator

HW BUS provides a signal (PREP RAD) that is normally used to disable movements in standard RAD procedures. Positioner will use this signal instead of disable movements when requested by the generator. Inhibit through R2CP messages is not strictly necessary.



Selected workstation contains generator node number and positioner node number. Generator can use this information to address inhibit to proper destination node

10.9.3 Inhibit issued by the Positioner



10.9.4 System Messages not related to inhibit RX or movement

This type of system message only requires to be displayed, generator and positioner will discard them. They are sent with 0x00 destination (all nodes registered to receive System Messages Index messages).

11. MESSAGE INDEX TABLE

GUI MESSAGE GROUP INDEX 0x80		
GROUP	**SUBINDEX**	**DESCRIPTION**
SYSTEM MESSAGE	1	SYSTEM MESSAGE
	2	REQUEST ALL SYSTEM MESSAGES
	3	
	4	
	5	
	6	
	7	
	8	
	9	
LIGHTS	10	REMOTE MANAGEMENT
	11	TURN ON/OFF
	12	
	13	
	14	
	15	
	16	
	17	
	18	
	19	
SOUNDS	20	REMOTE MANAGEMENT
	21	TURN ON/OFF

	22	
	23	
	24	
	25	
	26	
	27	
	28	
	29	