

Deliverable D25.7

User Manual

Part I - Session management

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Version 1 Delivery date: 18.01.2019

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1 Overview

About this manual

This manual describes how to use the CLARC framework.

Usage

This manual describes the protocol that allows an user to manage the CLARC framework.

Who should read this manual?

This manual is intended for those users in charge of managing the CLARC framework as a tool for automatizing the Comprehensive Geriatric Assessment (CGA) tests.

Prerequisites

- The reader should have basic skills on managing a personal computer
- The CLARC framework has had to be previously deployed (see <u>User's Manual - Part III</u>)

Organization of chapters

The manual is organized in the following chapters:

Chapter	Title	Contents
1	Introduction	Contains basic information about the CLARC framework, and explanations of the terms and concepts needed for understanding the rest of the document.
2	Turning on	Instructions for turning on the CLARC frame- work
3	Launching a CGA test	Performing a Barthel or Get Up & Go test
4	Shutting down	Instructions for shutting down the robot
5	Charging the robot	The process for charging the robot

2 General information

2.1 Terms and concepts

CLARC is a complete framework for robotizing two specific tests that are typically part of a Comprehensive Geriatric Assessment (CGA) procedure: the Barthel test and the Get Up & Go test. CLARC consists of two major elements: **CLARA**, a social robot able to interact with the patients, and capture and analyze the obtained data; and the **CGAmed**, a local server able to store a database with all captured data and to provide the physicians with the tools for online monitoring and offline editing and supervision. CLARC provides all hardware items and do not require any specific constraint to be deployed.

2.1.1 Hardware concepts

Overview

This section introduces the hardware in the CLARC framework.

Additional information

The hardware in the CLARC framework is also described in the deliveries

User's Manual - Part III - System deployment

CLARC - Functional prototype

Standard hardware

The table below describes the standard hardware in an CLARC framework

Hardware	Explanation
CLARA robot	The robot is based on a differential driven platform by MetraLabs.
Charging station	The robot has a charging station to be able to charge autonomously.

Remote Control	Portable device connected to the robot that allows the user to interact with the system using large buttons.
Router	CLARC works in a local network , in which all the components are connected to the wifi provided by this router.
CGAmed embedded PC	This PC stores all the information about users, sessions, etc.

2.1.2 The CGAmed server

Overview

This section introduces the webs in the CGAmed station

Additional information

The use of the CGAmed web for reviewing the results is described with details in

User's Manual - Part II - Results review

Webs in the CGAmed

The table below describes the webs in an CGAmed station

Web	Explanation
Administration 192.168.0.70	 The administration web is used to configure The positions where the robot is going to perform the tests The list of patients The IP address of the camera for online supervision mounted on CLARA robot (Section 1.1.1 - The CLARA robot)
CGAmed 192.168.0.70/cgamed	 The CGAMed is used to: Add new patients. Add new sessions. Start/Stop a session. Pause/Resume a session. Move the robot to a position (from a list of predefined ones). See and compare the results of the tests.

2.2 User Access

The table below provides the default user/password data needed to access to the modules in the system.

Module	Access						
Linux based PC (CLARA)	Password: scitos						
Windows based PC (CLARA)	cessible from the Linux based PC using the Remmina remote desktop app						
CGAmed embedded PC	User / password: isis / grupoisis						
CGAmed	URL (CGAmed) 192.168.0.70/cgamed user / password: adminWeb / admi- nSecure URL (Administration) 192.168.0.70 user / password: admin / adminRobot						



Note: All CGAmed stations share currently the same IP Address. Contact us if you need to change this address, as this change implies internal updates on the software modules on CLARA robot.

3 Turning on the CLARC framework

3.1 The CLARA robot

3.1.1 Turning on the robot

Overview

This section explains how to turn on the robot.



The video <u>Starting.mp4</u> explains how to turn on the robot. As the video shows, when you turn on the robot using the key, the two internal PCs are automatically turned on.

Note: Once the PC's are on, you must connect the Linux based PC to the local wifi network provided by the router (See Section 3.1).

3.2 CGAmed web

3.2.1 Login in the CGAmed web

Overview

This Section describes the procedure for entering within the CGAmed web. This web provides the tools for (a) scheduling the agenda of a CLARA robot, or (b) manually launching a CGA session.

Login in the CGAmed web

When you connect to the URL of the CGAmed web (http://192.168.0.70/cgamed), you need to add user and password for entering on the web. This data is provided in Section 1.2 (page 7).

☑ 192.168.0.70/cgamed/#/ × +									
\leftrightarrow \rightarrow C (i) No	es seguro 192.10	58.0.70/cgamed	1/#/			☆	<u>۸</u> 8	:	
Login	Robot control	Test result	Schedule			Language	*		
Login									
Username									
Username									
Password									
Password									
Log in									

Once logged into the web, the main page allows you to access to three different services. It is also possible to choose the Language or to Close the session.



3.2.1 The Robot Control service on the CGAmed

Overview

The Robot Control interface provides the user with the tools for (a) visualizing the agenda of the CLARA robot, (b) manual launching or stopping of a CGA test, and (c) online supervising the session.

The Robot Control interface

Just clicking on the Robot Control icon in the main page of the CGAmed you access to the interface shown below.



Windows for online monitoring (video streaming and session log)

The Robot agenda is updated by using the Schedule service, on the main page (see Section 2.2.3, page 12).

3.2.2 The Schedule service on the CGAmed

Overview

The Schedule interface provides the user with the tools for managing the agenda of the CLARA robot. It allows to add patients and sessions to the agenda of the robot. This data can be visualized in the Robot Control interface.

2.2.3a The Schedule interface

				Choose robot					
192.168.0.70/cgamed/#/CGA	_co × +					23			
\leftrightarrow \rightarrow C \blacktriangle No es seg	guro 192.168.0.70/cgam	ed/#/CGA_Control			⊶ ☆ 📕 \varTheta	. :			
	Home	Robot control Test result	Schedule	Language - Close sesion					
					2				
Robot schedule					CLARC				
Date	Start time	Room	Sesion	Patient	Status				
18/12/2018	11:52	habitacion_1	1 - Barthel	Juan (ID 78585940)	Finished	4			
			Delete selection	Edit selection	Add new entry				
			*						

Managing(delete, edit or add) the sessions

2.2.3b Adding a new patient



The process to add a new patient is explained in the <u>SetUp.avi</u> video (from 2:37).

The procedure for adding a new patient consists of the following steps:

1. Choosing a robot

192.168.0.70/cgamed/#/CGA_Cor × +	•	1							83
← → C ▲ No es seguro 192.10	68.0.70/cgamed/#/CGA_Contr	ol				07	☆	. 0	:
	Home Robot control	Test result	Schedule		Language - Close sesion				
Robot schedule						Select from list	of CLAR	C robots h	iere 🔻
Date Start tin	ne Roo	m	Ses	ion	Patient	Status			
No se han encontrado sesiones									* *
			Delete selectio	n	Edit selection	Adr	d new ent	īv	
			50000 3010010		Lacoolotion			.,	

2. Add a new entry

/ 0	es seguro 192.168.0.70/cgame	ed/#/CGA_Control			or 🕁 📕	θ
	Home	Robot control Test result	Schedule	Language - Close sesion		
obot schedu	ıle				CLARC	
Date	Start time	Room	Sesion	Patient	Status	
8/12/2018	11:52	habitacion_1	1 - Barthel	Juan (ID 78585940)	Eliminated	
			elete selection	Edit selection	Add new entry	

() 192.168.0.70/cgamed/#/CGA	_Co: × +									X
← → C ▲ No es se	guro 192.168.0.70/cg	gamed/#/CGA_Contro	l.				0-7	☆	ト 6):
	Hom	e Robot control	Test result	Schedule	Language + C	lose sesion				
									Á	
Robot schedule	Add sessior	1					×	F		¥
18/12/2018	Patient sele	ction 🛃			type filter	for patient selection			I.	¢
	ID	Name	Gender	Age	Clinician	Last Visit	- 1			
	78585940	Juan Perez	М	0	Dr Luiky	11/27/2018	÷			
	Language List of availble lar	iguages		T	Place	V Discard changes	Save	1 new er	ıtry 🗸	

3. Click on the icon 🏜 for adding a new patient

4. Add information about the patient

192.168.0.70/cgamed/#/CGA_Cc × +				Ŀ		23
← → C ▲ No es seguro 192.168.0.70/cgamed/#/CGA_Control			07	☆ <u></u> ~	Θ	:
Home Robot control Test result	Schedule	Language - Close sesion				
					^	
Robot schedule Add patient			×		H	v
Date 18/12/2018 Name Antonio First surname Bandera Second surname Gender Select a Gender • Date of birth Guardian	Clinician Comments Level interaction Barthel MiniM 0 0 Illiterate Heari	interaction Level interaction fental GetUpAndGo 0 ng problems Vision problems		new entry	Ţ	

5. Close and save the patient profile.

192.168.0.70/cgamed/#/CGA	_Co: × +	E		Concession and		
$\epsilon ightarrow \mathbf{C}$ ($lacksquare$ No es se	guro 192.168.0.70/cgamed/#/CGA_Control				0 4 🕁	0 :
	Home Robot control Test result	Schedule	Language 🗸	Close sesion		
					- 1	A
Debeteebedule	Name	Clinician				
Robot schedule	Antonio	Dr. Alvaro Dueñas				
Date	First surname	Comments				.
18/12/2018	Bandera					Ĵ.
	Second surname Gender Male Date of birth 28/12/1971	Level interaction L Barthel M 0 Illiterate H	Level interaction ViiniMental 0 Hearing problems	Level interaction GetUpAndGo 0 Vision problems		
	Guardian			Cancel Add	patient	
					ji new i	entry 📮

2.2.3c Adding a new session



The process to add a new session is explained in the <u>SetUp.avi</u> video (from 3:35).

Once a patient has been chosen (for adding a new one, see Section 2.2.3b, page 13), the procedure for adding a new session consists of the following steps:

1. Choosing the Language for the test

192.168.0.70/cgamed/#/CGA	_Cor × +		. =						- 0	23
← → C ▲ No es seg	guro 192.168.0.70/cga	med/#/CGA_Conti	ol				0-7	☆	. 8) :
	Home	Robot control	Test result	Schedule	Language 👻 C	lose sesion				
									<u>^</u>	
Robot schedule	Add session						×			Y
Date	ID	Name	Gender	Age	Clinician	Last Visit	*		- 1	_
18/12/2018	78585940	Juan Perez	М	0	Dr Luiky	11/27/2018	*			Ŷ
					Place				I	
	List of avaible lang	uages		¥	List of avaible roooms	Ŧ				
	Tests	T	Level interaction		Date and time					
						Discard changes	Save	d new ent	ry 🗸	

2. Choosing the room

192.168.0.70/cgamed/#/CGA	_co: x +		-					• •		1 23
← → C ▲ No es seg	guro 192.168.0.70/cga	med/#/CGA_Contr	ol				07	☆	7	9:
	Home	Robot control	Test result Sch	nedule	Language 👻 Cl	ose sesion				
									L.	
Robot schedule	Add session						×			.
Date	ID	Name	Gender	Age	Clinician	Last Visit	•			_
18/12/2018	78585940	Juan Perez	М	0	Dr Luiky	11/27/2018	÷	1		Ţ
							- 1			
							- 1			
							- 1			
					Place		- 1			
	Español		¥		List of avaible roooms	¥				
	Tests				Date and time					
	1º List of avaible	•	l evel interaction							
						Discard changes	Save	d new e	entry	
									· · ·	

3. Choosing the test

192.168.0.70/cgamed/#/CGA	Co: x +				~ ~		
C -> C A No es se	Home Robot cor	trol Test result Schedule	Language - Close	sesion	¥ 10		, :
Robot schedule Date 18/12/2018	Add session				×		•
	Language Español Tests 1º List of avaible v	Level interaction	Place habitacion_1 Date and time	• • • • • • • • • • • • • • • • • • •	·		
			D	iscard changes Save	a new	entry 🖕	

4. Choosing the level of interaction of the text (10 if you do not want that the patient performs the training test, and 0 in the other case).

3 192.168.0.70/cgamed/#/CGA_C○ × +				
← → C ▲ No es seguro 192.168.0.70/cgamed/#/CGA	_Control		• \$	▶ ⊖ :
Home Robot of	control Test result Schedule	Language - Close sesion		
Robot schedule Add session			×	-
Date 18/12/2018				-
Language	۲	Place		
Tests	· · · · · · · · · · · · · · · · · · ·	Date and time		
1° Barthel • 2° List of available •	Level interaction	→		
		Discard changes :	Save J new er	ntry 🗸

5. Choosing the date and hour

192.168.0.70/cgamed/#/CGA	.co × +			
$\epsilon \rightarrow c$ A No es se	guro 192.168.0.70/cgamed/#/CGA_Control			⊶ ☆ <u>M</u> \varTheta :
	Home Robot control Test result	Schedule	Language - Close sesion	
				_
Robot schedule	Add session			×
Date 18/12/2018				
	Language	-	Place	
	Tests		Date and time	
1	2 ^a List of avaible ▼ Level interaction	10	13/12/2018 = 16 : 0	
			Discard changes	Save

6. Close and save the session

192.168.0.70/cgamed/#/CGA	.co × +				
← → C ▲ No es se	guro 192.168.0.70/cgamed/#/CGA_Control			0-	M 🛛 🔁 🗄
	Home Robot control Test result	Schedule	Language - Close sesion		
Robot schedule	Add session			×	-
Date 18/12/2018				^	÷
	Language		Place		
	Español Tests	۲	habitacion_1 •		
	1° Barthel Cevel interaction 2° List of availle Level interaction	10			
			Discard changes	Save J new 6	entry

Once the session has been closed, you can visualize the new entry on the Schedule and Robot Control interfaces.

192.168.0.70/cgamed/	#/CGA_Cor × +	-			
- > C 🔺 No	es seguro 192.168.0.70/cga	med/#/CGA_Control			or 🕁 🧏
	Home	Robot control Test result	Schedule	Language - Close sesion	
Robot schedu	le				CLARC
Date	Start time	Room	Sesion	Patient	Status
14/12/2018	16:00	habitacion_1	1 - Barthel	Juan (ID 78585940)	Pending
18/12/2018	11:52	habitacion_1	1 - Barthel	Juan (ID 78585940)	Eliminated
			Delete selection	Edit selection	Add new entry

Figure 1: Schedule interface - New entry on the robot's agenda

192.168.0.70/cgamed/#/robotCo × +								23
← → C ▲ No es seguro 192.168	3.0.70/cgamed/#/robotContro	ol_Robot				0-7 ☆		:
	Home Robot control	Test result	Schedule	Language 👻	Close sesi	on		
Patient live monitoring	a_Not_Found			Test session moni Patient session log	toring			
Robot status & schedule	Search	Test						
Patient Sesion	Language	Time	_	Controls				
Juan Perez 1-Barthel	Español	16:00	4	Call robot to r		List of avaible roooms		•
					Start selec	cted session		
				Pause / Resume cu	rrent ses	Stop current se	ession	

Figure 2: Robot control interface - New entry on the robot's agenda

4 Launching a CGA session

The process of launching a session, which has been previously programmed in the schedule service on the CGAmed (see Section 2.2.3c in <u>2.2.3 The Schedule service</u> <u>on the CGAmed</u>), implies to firstly start up the software architecture endowed in the CLARA robot (the CORTEX architecture).

4.1 Starting up the components on CLARA robot

Overview

This Section describes how to start up the CORTEX architecture in the CLARA robot.



The process to start up the components on CLARA robot is explained in the <u>Starting up robot components.ogv</u> video.

Starting up the components on CLARA robot

Previous steps

- 1. Turn on the router
- 2. Turn on the embedded PC with the CGAmed database and connect it to the local wifi network provided by the router
- 3. Turn on the Remote Control device (using the small black switch)

Starting up the software components on CLARA

4. Open a yakuake session and launch the start.sh script.

>>cd robocomp_clarc/robocomp/components/cajasvaciasechord/

>>./start.sh

The different agents on the CORTEX software architecture will be wake up.

Once all the components are started and the planner (Execution - Pelea shell terminal) is waiting for click, you can launch a test from the CGAMed web.

4.2 Launching a session

Overview

This Section describes how to launch a session previously scheduled (the CORTEX architecture in the CLARA robot has been started as explained in <u>Section 3.1</u>).

In the Robot Control tab of the CGAmed (see <u>Section 2.2.3</u>) appears the scheduled session

192.168.0.70/cgamed/#/robotCo	× +										1 23
$\epsilon ightarrow \mathbf{C}$ $igtarrow$ No es segur	o 192.168.0.70/cgame	ed/#/robotControl_R	lobot					c	→ ☆	<u>k</u>	9:
	Home	Robot control	Test result	Schedule	2	Language 👻	Close sesion				
Patient live monitor	ing Camera_Not_Fo	und			Test sessio	on monito ^{n log}	ring				
Robot status & sched	ule	Search Tes	st								
Patient Sesion	Langu	age Tin	ne	_	Controls						
Juan Perez 1-Barthel	Esp	añol 16:	:00	*	Cal		om L	ist of avaible rooom	S		•
							Start selected	d session			
					Pause / R	esume curre	ent ses	Stop curre	ent ses	sion	

Select the desired session in the **Robot status & schedule** list and push the **Start selected session** button.

192.168.0.70/cgamed/#/robotCo × +							- 0	23
← → C ▲ No es seguro 192.168.0.70/cga	med/#/robotControl_Robo	t			0-7	☆ <u>></u>	Θ	:
Home	Robot control Tes	t result Schedule	Language 🗸	Close sesior	n			
Patient live monitoring	Found	T P [est session monito	ring				
Robot status & schedule	Search Test							
Patient Sesion Lan	guage Time	C	Controls					
Juan Perez 1-Barthel E	ispañol 16:00	÷	Call robot to roo	om	List of avaible roooms		,	Ŧ
		7		Start select	ted session]
			Pause / Resume curre	ent ses	Stop current	session	ı	

5 Shutting down

Overview

This section describes how to shut down the robot in an correct way.



The process to shut down the robot is explained in the <u>Shutting</u> <u>down.ogv</u> video. After following the steps in the video you can shut down the Linux based PC.

Stopping the software components on CLARA

- 1. Launch the kill.sh script in "robocomp_clarc/robocomp/components/cajasvaciasechord/"
- 2. Close all the yakuake sessions.

Stopping the hardware components on CLARA

3. Shutting down the windows pc: connect to the windows pc using the remmina desktop application and click in "apagar equipo".

4. Shutting down the Raspberri Pi (old CLARA robot): connect to the Raspberry pi using ssh and stop it:

ssh pi@192.168.0.59

>>sudo poweroff

5. Shut down the linux pc.

Shutting down the remote control

6. To shut down the remote control, first press the small red button and then, when the red light will be off, move the black switch to the off position.

6 Charging the robot

Overview

If the robot detects that its battery is discharged, it will leave all it is doing (e.g. a test) and will go automatically to charge. Hence, it is recommended to **charge the robot every night** in order it be ready for doing tests during the day.



The process to charge the robot is presented in the **Charging.mp4** video.

To charge the robot, it must be correctly placed (centered) on the charging station and the key must be in the ON position. When it is charging, the small light close to the key of the robot is blinking and the "Charging" light in the base station is on.



Note: You can command the robot to go to the Charging Station by clicking the "call robot to room" button in the CGAMed web, selecting previously the base_station in the list of available rooms. In this case, you must control that, when the robot finish to move, it is well located in the charging station and it is charging. It must be noted that this option is only possible if the components of the robot are running and the base_station have been correctly calculated and written in the goalPositions.txt file and in the CGAMed database.

7 Bugs

Module	Problem
CGAmed	The IP Address is currently the same in all CGAmed stations. This will provoke conflicts when several robots work in the same environment.