

SARA- JKT @ ORM

USER'S MANUAL

THE OBSERVING GUIDE



02.2018

Content

In particular, here, the user will find the following taks:

1. Introduction	pg1
1.1 The telescope control computer	pg1
1.2 The CCD control computer	pg5
1.3 The Observatory computer	pg8
2. Preparing the observation night	pg11
3. Bias & Flats	pg15
4. Autofocus	pg17
5. Taking science images	pg19
6. Pointing the telescope	pg21
7. Dithering patterns & differential tracking	pg25
8. Stellarium	pg27
9. Troubleshooting	pg29

February 2018

1

1. Introduction (How to get familiar with the interface of the telescope control)

The main characteristics of the science camera (Andor Ikon L-2048) are:

- Field-of-View: 11.6x11.6 arcmin²
- Pixel scale: 0.34"/pixel
- QE > 90%
- Lineal up to ~60000ADU.

We strongly suggest to the new users to read the original SARA-JKT manual before to start to use this document. In that manual, the reader will find how to make the corresponding connections.

There are **THREE computers** to which the observer has to make the connection; the Telescope computer, the CCD computer & the Observatory computer (IP's, username & passwords are provided separately by the staff of the Telescope Operations Group, contact them at ttnn_a at iac.es).

1.1 The Telescope Computer

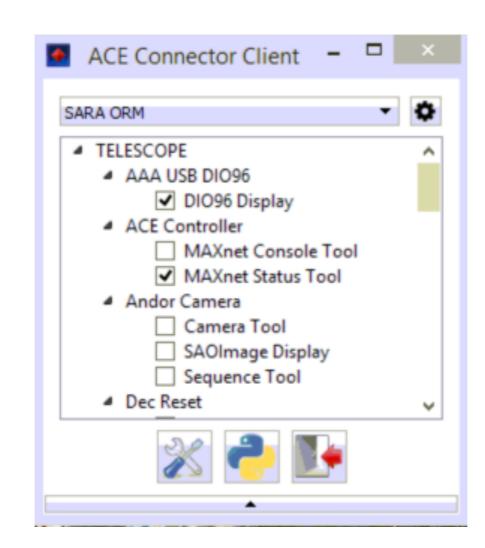
General view of the telescope control computer:

<complex-block>

Don't freak out!! There are a lot of windows, but you can control which ones are visible or not from the **Conector Client** window; just tick on/off in the desired checkbox.

JSER MANUAL

1. Introduction



The **Telescope information** window; shows the position of the telescope. When telescope is parked at zenith the airmass is 1.0, altitude $\sim 90^{\circ}$ and H.A. $\sim 00:00:00$.

	Telescope	Position	-		×
	03:2	20:33 U	тс		
	Twilight begin	s in 1 hour and 1	16 minutes	5	
	3:20 GMT-0000		20:19 LA	ST	
	JD 24575	63.63928 (J20)	16.48)		
	RA	20:29	:34.7	7	
	Dec	+40:20	0:37.	6	
		Gyanus			
	HA):09:40		
- (Airmass	1.0)2		
	Altitude	78			

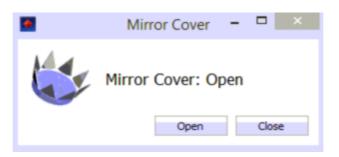
The telescope controlling window.



The DOME controlling window



The mirror shutter window:

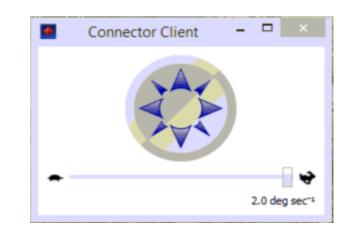


3

1. Introduction

1. Introduction

Manual control of the slew of the telescope:



Switch panel of the telescope motors:

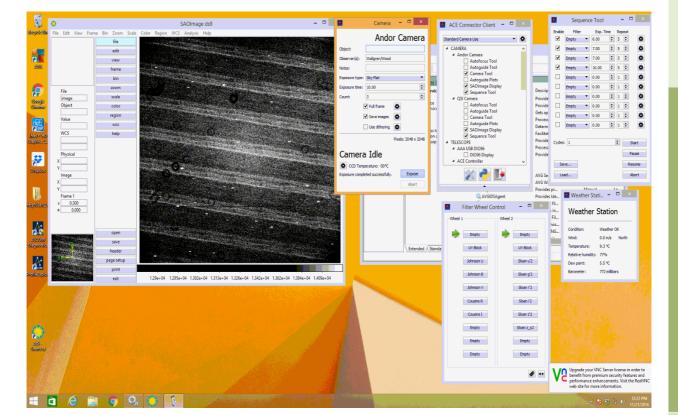
Switch Pa			×
Dec Reset	OFF	(
HA Reset	OFF	(
Oil Pump	OFF	(
Preload	OFF	(

Telescope focus window:

*	Focuser – 🗆 🗙
	Telescope Focus
100600	Focus
	101200
\ltimes	⊗ ≫
	Approximate Focus

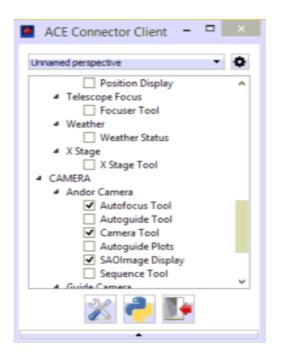
1.2 The CCD computer.

General view of the CCD controlling computer:



The most used & useful windows are:

The connector client window, which is used to activate/deactivate other windows:



SARA - JKT

5

USER MANUAL

9	Camera 🗕 🗆 🗙				
	Andor Camera				
Object:	XTE 1859+083				
Observer(s):	Pere Blay				
Notes:	TEST				
Exposure type:	Light 💌				
Exposure time:	220.00				
Count:	10				
	🖌 Full frame				
	Save images				
	Use dithering				
	Pixels: 2048 x 2048				
Exposin	ng				
CCD Temperature: -50°C					
100% Expose					
Exposure: 1009	6 complete				
6 more	Abort				

The auto-focus window:

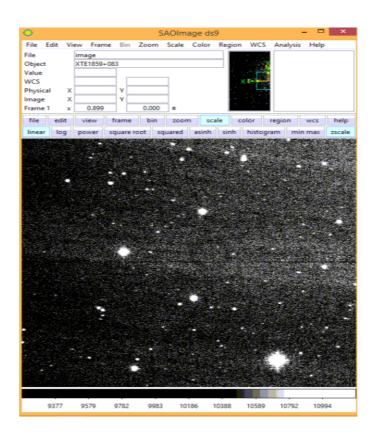
2	Autofocus -	×
Minimum focus:	99000	 •
Maximum focus:	102000	•
Number of images:	7	•
Exposure time:	20.00 seconds	•
	Start	

SARA - JKT

The filter wheel window:

	Filter	Wheel Control		×
Wheel 1		Wheel 2		
	Empty	۵	Empty	
	UV Block		UV Block	
	Johnson U		Sloan u'2	
	Johnson B		Sloan g'2	
	Johnson V		Sloan r'2	
ے 🔶	Cousins R		Sloan í 2	
	Cousins I		Sloan z'2	
	Empty		Sloan z_s2	
	Empty		Empty	
	Empty		Empty	
			_	

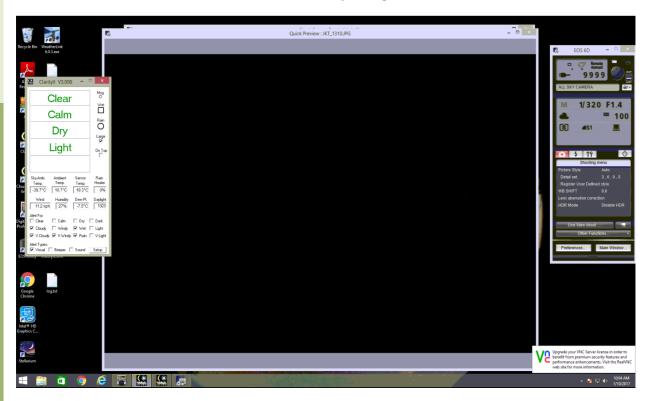
The SAO DS9 image display software:



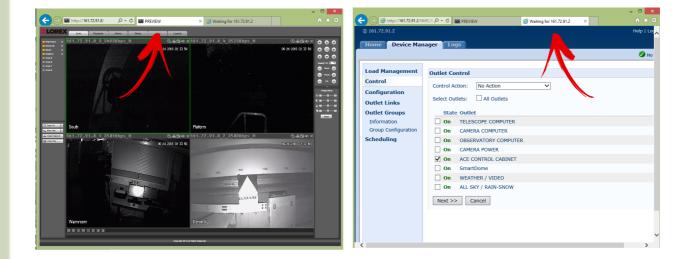
1. Introduction

1.3 The Observatory computer.

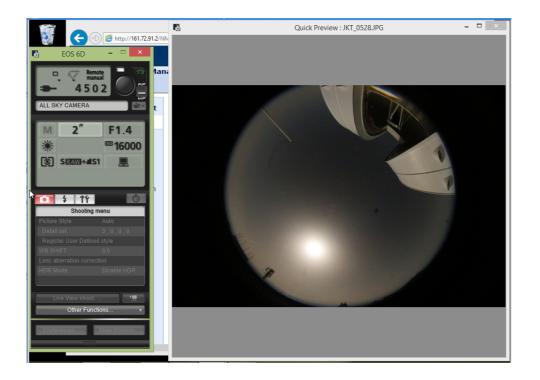
General view of the windows in the observatory computer:



Internet explorer with some tags already opened, such as the telescope cameras and the device manager:



Camera all-sky and its controls:



The weather information window:

🔛 Clarityll V3.008 -	×
Clear	Msg O Wet
Calm	□ Rain
Dry	
Light	On Top
Sky-Amb. Ambient Sensor Temp. Temp. Temp. -39.7°C 10.7°C 19.3°C	Rain Heater 0%
Wind Humidity Dew Pt. 11.2 kph 27% -7.5°C	Daylight 1023
I Cloudy □ Windy I Wet I V.Cloudy I V.Windy I Rain	Dark Light V.Light
Alert Types: Visual Beeper Sound	Setup

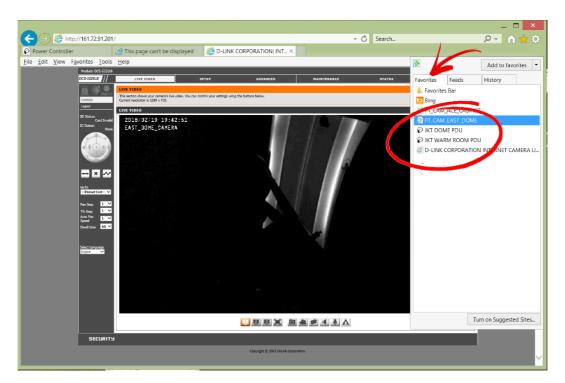
2. Preparing the observation night

2. Preparing the observation night.

- ✓ Make the connections to the THREE computers (telescope, CCD & Observatory) and check that all windows you need are visible (remember to use the ACE connector client window to activate/deactivate windows).
- ✓ In the Observatory computer: Watch the webcams of the dome and the control room to check that everything is ready for the observations: make sure that the window of the control room is covered. The all-sky camera can be used to see the dome.
- ✓ In the CCD computer: **check that the CCD is responding** by taking a couple of BIAS. Also check that the filter wheel is responding.
- ✓ In the Telescope computer: you have to check that the system is responding correctly; if you select one window and all "X" buttons (at the top right corner of the window, which is used to close the window) turn to red, this means that the ACE connector client must be re-initialized. If everything is OK (make sure that the mirror petals are closed!!), we can open the dome, by moving the dome to the East (at zenith), we will avoid the direct incidence of the sun on the telescope and we will also have it in position to start with the sky flats.
- ✓ If you think that something is **not working** properly, you have to re-initialize the Connector Client (see troubleshooting section, at the end of this document)
- > How to proceed if there is no window open in the Observatory computer:

The software that will be needed in this computer is the following:

- 1. Internet explorer
- 2. Canon EOS (to control the all-sky camera)
- 3. Weather



All this software can be found in the "Start" Menu. All links to the IP's of the webcams and the device manager appear in the "favorites" tag of the internet explorer browser (please use the official manual for usernames and passwords, or IPs if needed). After that you can check that everything is working following the instructions above.

How to proceed if there is no window open in the CCD computer:

Firstly, make sure that the computer is working, if so, we launch the "Connector Client" from the "Start" menu, then we can take a couple of BIAS to check that the CCD is responding.

How to proceed if there is no window open in the Telescope computer:

In that case, we have to launch the software "Services", which shows all the windows services that are running in the computer. This software can be found in the Windows toolbar as a two-gear icon, if not go to the "Start" menu.

	<u>Q</u> j		Se	rvices			_ 🗆 🗡	1
Dbject:	Eile Action View	Help						
								dor Camera
IA / Dec 🔹								 Autofocus Tool
+00* 00* 00.0	Services (Local)	Services Local						Autoguide Tool
		ACE NODE Service	Name	Description	Status	Startup Type	Log On As ^	Camera Tool
			ACE Node Service	Provides access to ACE instru	Running	Automatic	Local Syste	Mirror Cover
	. (Stop the service Restart the service	ActiveX Installer (AxInstSV)	Provides User Account Control		Manual	Local Syste	WIITO COVEL
nsiting now		Kestalt the service	😪 App Readiness	Gets apps ready for use the firs		Manual	Local Syste	
rrent alt.: 61°			Application Experience	Processes application compati		Manual (Trigger Start)	Local Syste	— — — —
		Description:	Application Identity	Determines and verifies the ide		Manual (Trigger Start)	Local Service	Mirror Cover
SLEW		Provides access to ACE instrumentation and other control of	Application Information	Facilitates the running of inter	Running	Manual (Trigger Start)	Local Syste	_ 🗆 🗡
		astronomy equipment.	🔍 Application Layer Gateway	Provides support for 3rd party		Manual	Local Service	
			Application Management	Processes installation, removal		Manual	Local Syste	peat
vious slew was aborted			AppX Deployment Service (Provides infrastructure suppor		Manual	Local Syste	÷ •
ID	r .		ASP.NET State Service	Provides support for out-of-pr		Manual	Network S	÷ • ī
ID	_t		ASUS Com Service		Running	Automatic	Local Syste	• •
TO SC ON THE WORK			ASUS System Control Service		Running	Automatic	Local Syste	
96600			AVG Antivirus	Manages and implements AV	Running	Automatic	Local Syste	÷ •
			AVG Service	AVG Service	Running	Automatic	Local Syste	÷ •
			avgbIDSAgent	Provides Identity Protection A	Running	Manual	Local Syste	÷ •
oogle AceSmartD			Background Intelligent Tran	Transfers files in the backgrou	Running	Automatic (Delayed Start)	Local Syste	• •
irome Shortcut			Background Tasks Infrastru	Windows infrastructure service	Running	Automatic	Local Syste	
			Base Filtering Engine	The Base Filtering Engine (BFE)	Running	Automatic	Local Service	÷ •
			BitLocker Drive Encryption	BDESVC hosts the BitLocker Dr		Manual (Trigger Start)	Local Syste	÷ •
			Block Level Backup Engine	The WBENGINE service is used		Manual	Local Syste	÷ •
IN HD bsc5 Screet Shr			Bluetooth Handsfree Service	Enables wireless Bluetooth hea		Manual (Trigger Start)	Local Service	• •
hics Co	928		Bluetooth Support Service	The Bluetooth service support		Manual (Trigger Start)	Local Service	
🖉 🔮 Weather Stati –			SranchCache	This service caches network co		Manual	Network S	Start 4
S			Certificate Propagation	Copies user certificates and ro	Running	Manual	Local Syste	Pause
Si Weather Stati	10		CNG Key Isolation	The CNG key isolation service i		Manual (Trigger Start)	Local Syste	
			COM+ Event System	Supports System Event Notific	Running	Automatic	Local Service	Resume
VPC Condition: Weater	ок		COM+ System Application	Manages the configuration an		Manual	Local Syste	Abort
Wind: 0.4 m/s			Computer Browser	Maintains an updated list of c		Manual (Trigger Start)	Local Syste	
Temperature: 5.8 °C			Credential Manager	Provides secure storage and re		Manual	Local Syste Y	
Relative humidity: 79%		Extended Standard						
Dew point; 2,5 °C								10 11 12 13
ALC: NOT THE REAL PROPERTY OF	and the second second			101101101300-000000				

The first service in the list should be "ACE Node Service", if the options stop & restart appear on the left (as shown in the picture) when we select this service, this means that the service is running, otherwise we should only have one option ("start"), so we click on this and wait until the service is running.

Once the ACE Node service is running, we can then launch the Connector Client.

NOTE. Please, realize that there are two different "Connector Client", one in the CCD computer and the other in the Telescope computer. As the service manager is only in the Telescope computer, the recommended sequence for re-initialize this software is: 1st. ACE node service in the telescope computer. 2nd. Connector Client in the telescope computer. And 3rd Connector Client in the CCD computer.

S.

ARA - JKT

After checking all this, you have to make the directory where all images will be saved. To do so, you have to go to unit D:\ (Images) and into the folder IAC, you can make a new folder for your data, following this structure YYYYMMDD, which corresponds to the data of the beginning of your night (going there you will see folders of former IAC observers). You have to write this path (D:\IAC\YYYMMDD\) in the "Camera" acquisition window. In that window click on the gear to the right of the "Save Images" (left picture), and the "File Saving" new window (right picture) will pop up:

	Camera	×	2	File Saving	? ×
Object:	1	Andor Camera	<u>Archive directory:</u> Processing directory:	D:\IAC\20180218\	
Observer(s): Notes: Exposure type:			Eilename: Number: Script for <u>b</u> ias images:	Bias_1x1_1MHz_{{seq:3}}.fits 34	•
Exposure time: Count:	10 V Full frame	÷	Script for dark images	:	
	✓ Save images	Pixels: 2048 x 2048	Script for <u>d</u> ome flats: Script for <u>s</u> ky flats: Script for <u>object</u> image	251	
Camera		Expose Abort		OK	Cancel

As can be seen, the first field is the path of our directory (D:\IAC\YYYYMMDD\), you have previously defined. In the third field ("Filename"), you have to define the format of the filenames, use the structure {{seq}}, which increase sequentially the number used to label the filenames, starting with the number specified in the forth field "Number" (34 in the snap).

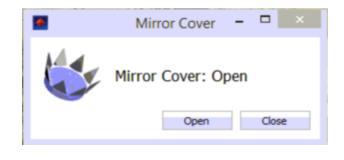
Check the weather conditions, and if these are good, you can proceed to open the dome. To do so, you only have to click on the icon of the open dome in the dome window of the telescope computer (see the snap to the left). Once the dome is open, you should see the snap to the right.

SER MANUAL

2. Preparing the observation night

Do Do	ime –	□ ×			Dome	-		×
	ome is closed			Ĩ	Dome is oper	n		
	Azimuth: 90° East			1	Azimuth: 13 Southeast	31°		
90	Go	0 *			Go		P	*
	Set				Elevation: 0° Set			
Weather: OK to op Rain sensor au Watchdog aut	uto dose	8	(-	to open sor auto close g auto close			×

Next step, is to open the mirror cover...go ahead, that's really easy!!



Let's summarize the tasks in order to prepare the night:

- 1. Make the connection to the THREE control computers
- 2. Check that everything is working, in particular the Connector Client, if not, launch it. Also check that the ACE Node Service is running.
- 3. Check that the weather conditions are good to open the telescope.
- 4. Define the folder where you will save your images.
- 5. Open the dome, and after that open the mirror petals.

3. BIAS & FLATS

The two types of images are taken from the CCD computer. In the Camera window:

	Camera	- 🗆 ×
		Andor Camera
Object:		
Observer(s):	Fletcher	
Notes:		
Exposure type:	Bias	•
Exposure time:	Light Bias	
Count:	Dark Flat Sky Flat	•
<u> </u>	Save images	0
		Pixels: 2048 x 2048
Camera		
		Expose Abort

In the fourth field, "Exposure type", we pick out the option "Bias", and you will see that the exposure time is set to zero, in the "Count" field, you define the number of BIAS images you wish. Make sure that the "Save Images" checkbox is ticked. You can fulfill the fields "Object", "Observer" and "Notes" as you wish to appear in the header of the fits files, and finally click on the "Expose" button.

Concerning the flats, just pick out this option in the "Exposure type", and proceed as described above. Just remember that in that case, you have to define the exposure time. It is not possible to take **dome flats** (there are no lights that can be controlled), so only **sky flats**. (here you will find some blank fields).

Some tips to take into account for the flat images:

- Take an image of 1 second exposure time and depending on the counts you measure on the image, rescale the exposure time in order to achieve a value between 35000-45000 (~2/3 of the dynamical range, where the CCD response is linear).
- At the beginning of the night, the filters should be sorted as:

U u' z' B g' V R r' I i'

At the end of the night the filters should be sorted inversely.

RA - JKT

USER MANUAL

Dear observer, you are lucky!!!! The JKT has an autofocus script!! Normally, the focus should lie between the positions 95000 and 100000. The best option is to find a field with a ~8 magnitude stars from any catalogue available (click <u>here</u> to check out some catalogues of standard stars), or using the Stellarium application (installed on the Telescope computer), and point to this field. The JKT autofocus takes a series of images at different positions of the focus, then determines the mean FWHM of the stars that are in the images, and calculates the position of the focus that minimizes the FWHM. So, in the window of autofocus (in the telescope computer):

2	Autofocus	• • ×
Minimum focus:	99000	•
Maximum focus:	102000	•
Number of images:	7	.
Exposure time:	20.00 seconds	-
	Start	

You have to fulfill the data needed to run this task, it is as simple as it pretends to be!!... Define the minimum and the maximum position of the focus you want to scan and the number of images to be taken, and the exposure time for each image. Take into account that the counts to be read, should fall inside the dynamical range of the CCD (so large exposures times could saturate the image). Clicking on the "Start" button, the script will do all the job, finding out the best focus position, you only have to "Accept" the estimated optimal value and then go to the "Focuser" window, to check that the focus position of the telescope is the same that the one calculated. If not, you have to type it by hand and then click on the "Focus" button.

Focuser -	. 🗆 🗙
Teleso	cope Focus
Fo	cus 🔞
	101200
2	≫
Approximate Focus	
	Teleso Fo

17

ARA - JKT

5. Taking science images

5. Taking science images

As described in section 3 (bias & Flats), you have to pick out the option "Light" in the "Exposure type" field, and then we proceed as usual: decide the exposure time, make sure that the "Save Images" checkbox is ticked, write the information about the "object", "Observer" and "Notes". Also remember to check that the filter is the one you need; to do so, use the filter wheel control window:

	Filter W	heel Control		x
Wheel 1		Wheel 2		
	Empty	۵	Empty	
	UV Block		UV Block	
	Johnson U		Sloan u'2	
	Johnson B		Sloan g'2	
	Johnson V		Sloan r'2	
ا 🔿	Cousins R		Sloan í 2	
	Cousins I		Sloan z'2	
	Empty		Sloan z_s2	
	Empty		Empty	
	Empty		Empty	
			4	41

Just click on the filter you wish, and the filter wheel will do the rest...the green arrow indicates that the action is done.

About the **AUTOGUIDING**: The JKT does NOT have any auto-guiding system. Our experience shows that the tracking of the telescope is good enough for exposures times below 300 seconds. So, if you have to expose larger than that, consider to split it up in shorter exposures considering the above limit.

BINNING & WINDOWING. This option is available in the "Camera" window (PC CCD). You have to deactivate the "Full Frame" checkbox and click on the gear button just on the right, a new window "Image geometry" will appear, from which you can define the binning and the size of the window. Binning options start from 1x1 (default) up to 16x16, and any window size is possible, although square pattern would be typical.

2	Camera		×	2		Image	Geometr	у	?)
		Andor	Camera	Readout	mode: [2]	1 MHz				
Object:				Binning:	1		÷	1		[
Observer(s):	Fletcher			Overscar	n: 0		÷	0		[
Notes:				Region	ofinterest					
Exposure type:	Bias		•	Left:	1	-	Bottom:	1		\$
Exposure time:	100.00		* *	Right:	2048	\$	Top:	2048		¢
Count:	10		÷					OK	C;	ancel
	 Full frame 	•								
	✓ Save images	•								
	Save images									
	✓ Save images		ixels: 2048 x 2048							
	✓ Save images		ixels: 2048 x 2048							
	Save images		ixels: 2048 x 2048							
	✓ Save images		ixels: 2048 x 2048							
Camera			xels: 2048 x 2048							
Camera	a Idle		xels: 2048 x 2048							
			ixels: 2048 x 2048							
	a Idle		ixels: 2048 x 2048							
	a Idle		ixels: 2048 x 2048							
	a Idle									
	a Idle		ixels: 2048 x 2048							

To summarize:

- 1. Pointing the telescope to your target (see next section)
- 2. Select "Exposure type" as "light"
- 3. If you want to change the file names (starting from a different number, for example), click on the gear right to the "Save Images" in the "Camera" window.
- 4. Make sure that the "Save Images" checkbox is ticked.
- 5. Fulfill the "Object", "Observer" and "Notes" fields to appear in the fits header.
- 6. Click on "Expose"

6. Pointing the telescope

6. Pointing the telescope

This task is done from the Telescope computer, where you will find the "Slew Telescope" window, which allows you to move the telescope:

	Slew Telescope					
		🔊 Dome linked 🔻				
TE J1859+083		Resolve				
essful.		*				
18h 59m 01.6≠	Proper	0.00				
+08° 14′ 44.2″	(mas yr ⁻¹)	0.00				
		Constellation: Aquila				
Transit: 01:59	Se	et: 08:19				
rom now						
	м	ax. alt.: 69°				
SLEW	CANCEL)				
		Ζ				
TRACK	ING					
	essful. 18 ^h 59 ^m 01.6 [±] +08° 14′ 44.2″ Transit: 01:59 rom now	essful. <u>18^h 59^m 01.6</u> <u>H08° 14' 44.2</u> Transit: 01:59 M				

In the field "Object", we can write the name of our object according to SIMBAD or NED databases. Clicking on "Resolve" button, the application will search the object in these databases and will download coordinates and proper motion.

With the correct coordinates, you have to make sure that the dome follows the telescope pointing, to do so the dome must be "linked" to the telescope, as shown at the top-right corner. If not, just click there and select the "Default" option:

	Slew Tele	scope	- • ×
			Dome linked
Dbject:	XTE J1859+083		Default
Name resolution su	ccessful.		Unlink dome
10000	18h 59m 01.6≠	Proper Motion	0.00
32000 🔻	+08° 14′ 44.2″	(mas yr ⁻¹)	0.00
			Constellation: Aquila
Rise: 19:40	Transit: 01:59	S	Set: 08:19
Transits 28 minutes	from now		
Current alt.: 68°	SLEW	CANCEL	4ax. alt.: 69°
Slew successful	TRACK	ING	Z

22

Finally, just click on the green "Slew" button to point the telescope to the coordinates introduced.

You also can write the coordinates of your target manually in the corresponding fields; on the left menu you can choose between four options: J2000/B1950: in that case you have to introduce R.A. and Decl. coordinates. HA/DEC: Hour Angle & Declination coordinates. Solar System: you can pick out several objects of the Solar System. Once you have introduced the coordinates, follow the above instructions (dome linked and Slew).

When the telescope will reach the desired pointing, it can be read "TRACKING" at the bottom of the window and also "Slew successful". In case you read another message, such as "**IDLE**" or "**Previous slew aborted**", don't be scared, just go to the troubleshooting section and follow the instructions.

There are two extra buttons in this window:



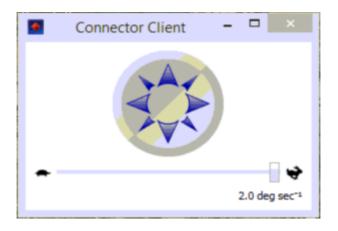
This is used to send the telescope to the zenith position. Once you click this button, you don't need to click on the green "Slew" button. If the telescope doesn't respond properly (giving a message like "Previous slew aborted"), then we can introduce the coordinates manually: choose HA/Dec and type 00:00:00 as HA and 28:XX:00 as Decl. and then click on the "Slew" button.



This is used to make offsets with the telescope. Once you click on it, a new window will appear, in which you can define the offset you wish:

2	Sle	w Telesc	ope		-		x
				٩	Dome	not lini	ked 👻
Dbject:				_		Reso	lve
HA / Dec 💦	Pointi	ng Offset		1			
HA / Dec	North	+0° 00' 00	"		S	end	
	East	+0° 00' 00	"		R	eset	
					UTION CIN		erpens
Rise: 03:21 Sets in 6 hours	12				.29		
Current alt.: 61°				Max. al	t.: 61°		
	SLEW		CANCEL				
Previous slew was aborted							z
		IDLE					

Offsets can also be done manually using the "Connector Client" window:



In that window, use the sliding bar at the bottom to define a slow motion (turtle) or a quick motion (hare). The direction of the offset will be given by the blue arrow that you will click; then the telescope will be moving while you keep the arrow clicked and will halt when you stop to click the arrow.

To summarize:

- 1. Define the object or its coordinates by resolving the object or by introducing its coordinates manually.
- 2. Make sure that the dome is linked to the telescope.
- 3. Click on "Slew" green button.

7. Dithering patterns & differential tracking

The JKT offers very restricted options for the dithering patterns; this is done in the Andor Camera control window, which can be found in the CCD computer, but also in the Telescope computer.

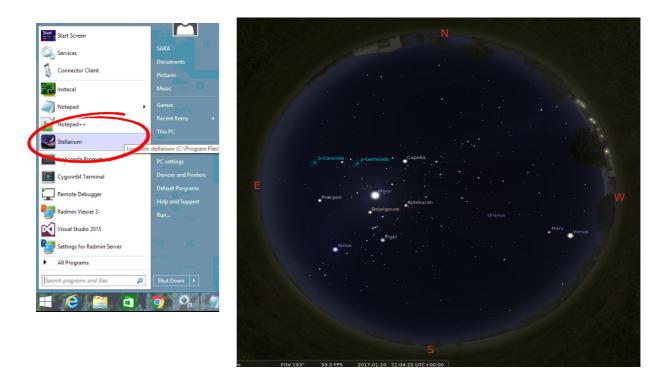
	Camera		×
	Ando	r Can	nera
Object:			
Observer(s):	ACE		
Notes:			
Exposure type:	Light		•
Exposure time:	1.50		-
Count:	1		÷
	Full frame	•	
5	 Save images 	•	
0	Use dithering	*	
		Pixels: 204	8 x 2048
~	T II		
Camera	Idle		
CCD Temp	erature: -50°C		
Exposure comple	ted successfully.	Ex	pose
		A	bort

As easy as it seems....just click on the gear button on the right of the "Use dithering", and a new window will pop up, in that window define the dithering offset to be applied after each exposition. After that, remember to tick on the corresponding checkbox.

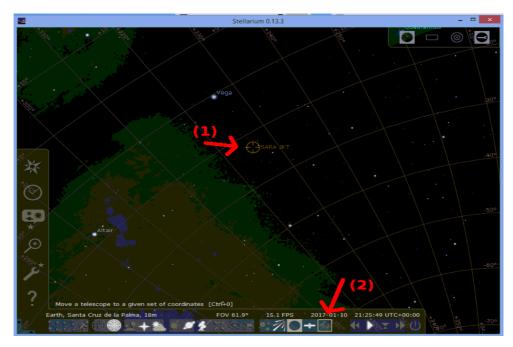
Concerning the Differential tracking, this option is only available for objects of the Solar System, so far.

8. Stellarium

Stellarium is a planetarium software that shows exactly what you see when you look up at the stars, this means from the JKT. The application is already installed in the Telescope control computer. The software can be found in the "start" menu:



The application also displays the telescope pointing (1) and you can also pick out an object and send the telescope to point to that object directly (2):



USER MANUAL

9. Troubleshooting

9. Troubleshooting

- The telescope does not reach the desired position and apparently keeps moving. The symptoms are the following:
 - (a) In the "Slew Telescope" window you read this message: "IDLE" or "Previous slew was aborted".
 - (b) In the "Telescope position" information window, you see a significant variation of the R.A. and Dec. coordinates.

•	Slew Telescope	- 🗆 🗙	-	-	D 111		×
		Dome linked 💌	•	Telescope	Position		
Object:	07h 04m 23.7n Proper Motion (mas yr*1)	Resolve	:		20:33 UT		
		onstellation: Monoceros		JD 2457	563.63928 (J2016	.48)	
Rise: 18:52 Set 3 hours and 17 m		06:53		RA	20:29:	34.7	
Current alt.: -42°	Max	. alt.: 60°		Dec	+40:20	:37.6	
					Cygnus		
				HA	-00:0	9:40	
Previous slew was ab	ported	Z		Airmass	1.02		
	IDLE	-		Altitude	78		

You should go to the "switch panel" windows, from which you can control the motors of the telescope:

Switch Panel 🛛 🗖 🗙
Dec Reset OFF 📦 HA Reset OFF 🎯 Oil Pump OFF 🎯 Preload OFF 💮

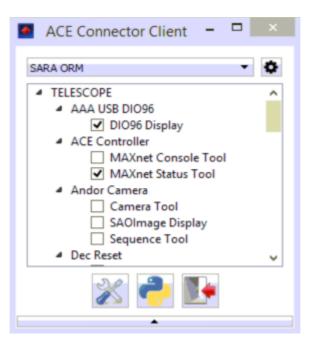
You have to turn on the "Dec Reset" switch and then off. We repeat the process for the "HA Reset" switch, once the two switches are back to off position, you then click on the green button "Slew".

29

All windows show the "X" button (used to close the window) in red and/or the windows don't respond.

In than case, there are three levels of actions to fix it.

First level: you should close the "ACE Connector Client" window, and reinitialize the application from the "start" menu of the telescope computer.



Second level: In case that the problem persists (first level action doesn't succeed), then you have to shut down again the "ACE Connector Client" window, and go to the "services" window and restart the "ACE Node Service" (just click on the "restart" clickable word in red)

ile Action View	Help						
Services (Local)	Services (Local)						
	ACE Node Service	Name	Description	Status	Startup Type	Log On As	
		🔍 ACE Node Service	Provides ac	Running	Automatic	Local Syste	
	Stop the service	ActiveX Installer (AxInstSV)	Provides Us		Manual	Local Syste	
	Restart the service	🔍 App Readiness	Gets apps re		Manual	Local Syste	
		Application Experience	Processes a		Manual (Trig	Local Syste	
	Description:	Application Identity	Determines		Manual (Trig	Local Service	
	Provides access to ACE	Application Information	Facilitates t	Running	Manual (Trig	Local Syste	
	astronomy equipment.	Application Layer Gateway	Provides su		Manual	Local Service	
		Application Management	Processes in		Manual	Local Syste	
		AppX Deployment Service (Provides inf		Manual	Local Syste	
		ASP.NET State Service	Provides su		Manual	Network S	
		🔍 ASUS Com Service		Running	Automatic	Local Syste	
		🔍 ASUS System Control Service		Running	Automatic	Local Syste	
		AVG Service	AVG Service	Running	Automatic	Local Syste	
		🔍 AVG WatchDog	AVG Watch	Running	Automatic	Local Syste	
		🔍 AvgAMPS	Provides pr		Manual	Local Syste	
		AVGIDSAgent	Provides Ide	Running	Automatic	Local Syste	
		🧠 Background Intelligent Tran	Transfers fil	Running	Automatic (D	Local Syste	
		🖓 Background Tasks Infrastru	Windows in	Running	Automatic	Local Syste	
		鵒 Base Filtering Engine	The Base Fil	Running	Automatic	Local Service	
		🖓 BitLocker Drive Encryption	BDESVC hos		Manual (Trig	Local Syste	
		🖓 Block Level Backup Engine	The WBENG		Manual	Local Syste	
		Bluetooth Handsfree Service	Enables wir		Manual (Trig	Local Service	

9. Troubleshooting

Once this service is restarted, you have to initialize again the "ACE Connector Client" from the "start" menu.

Third level: If the problem still persists, then Switch off the "ACE Connector Client" window, after "stop" the "ACE Node Service" (click on "stop" instead of "restart"), then go to the "device Manager", which is in one tag in the Internet Explorer of the Observatory computer, and from there you have to switch off and on the "ACE CONTROL CABINET" (line 5), simply click on the blue "Switch OFF" to the right.

Power Controller This page can't be displayed D-LINK CORPORATION INTER D JKT WARM ROOM PDU X File Edit View Favorites Tools Help	– 🗆 🗙
File Edit View Favorites Tools Help	- 🗎 🖈 🔅
# Name State OFF/ON CYCLE	
1 TELESCOPE COMPUTER ON Switch OFF Cycle	
2 CAMERA COMPUTER ON Switch OFF Crick	
4 CAMERA POWER ON Switch OFF Crick	
5 ACE CONTROL CABINET ON Switch OFF Crick	
6 BOLTWOOD / ALL SKY USB EXT ON Switch OFF Crycle	
8 ALL-SKY / RAIN-SNOW ON Switch OFF Cycle	
Lozout Help	1 sec.

If this tag is not available in the Explorer browser, you can login using this IP: 161.72.91.2 (user: SARA, password: orm).

After some seconds, the ACE Control system in initialized, and you can proceed starting the "ACE Node Service" (just click on the "start" word), and finally switch on the "ACE Connector Client" window.

31