SAPIR 2
Dealer installation manual

GOLDTEC
CONTROL SYSTEMS

Goldtec Control Systems Pty Ltd
Email: info@goldtecsystems.com.au
Web: www.goldtecsystems.com.au

Document version 2.02

Contents

1. Introduction 3
..... 4
2. The system structure 5
2.1 Hardware 6
Interfaces 7
3. How to connect the interfaces 8
4. Mounting the controller 8
5. Energizing the controller 9
6. Communication 9
6.1 – Connection to the server 9
6.1.1 – Cellular modem 11
6.1.2 – WI-FI 11
7. Definitions for server connections 11
7.2 By serial connection 15
Programming the Sapir 2 Controller using the SerialTool Software 15
Indication LED's status 19
8. Communication with the controller 20
8.1 Available internet connection 20
8.2 No internet connection 20
9. First introduction with the console 21
9.1 What is CONSOLE? 21
9.2 Downloading 21
10. First introduction and downloading 21
10.1 What is SPOT? 21
10.2 Downloading from the Android operating system 21

10.3 Downloading from the IOS operating system 22
For further information please refer to:
“SAPIR 2 - CONSOLE User Manual” / “SAPIR 2 - SPOT User Manual” 22

1. Introduction

The SAPIR 2 is the next generation of central control irrigation systems. It allows combining various technologies to suit each project specific needs. It is an Internet enabled controller that gives the user the ability to control and monitor everything from everywhere at any time, using his PC or Smartphone.

The SAPIR 2 is the perfect solution for small to medium irrigation projects with a single irrigation head, suitable for both simple and most demanding applications.

SAPIR 2 – Irrigation Network
Max 32 Outputs

- Main valve -1
- Irrigation valves -32
- Fertilization valves -4
- Fertilization Booster -1
- Filters-31
- Downstream valve -1
- Sattellites -16

Sapir 2 Configuration	
Sites	**Max Quantity**
Irrigation line	1
Local Fertilization site	1
Local Filtration site	1
Outputs	
Main valve	1
Irrigation valves	32
Injectors	4
Booster	1
Agitators	4
Filters	31
Downstream valve	1
Satellites	16
Maximum Total number of outputs	32

SAPIR 2 – Irrigation Network
Max 30 Digital and 48 Analog inputs

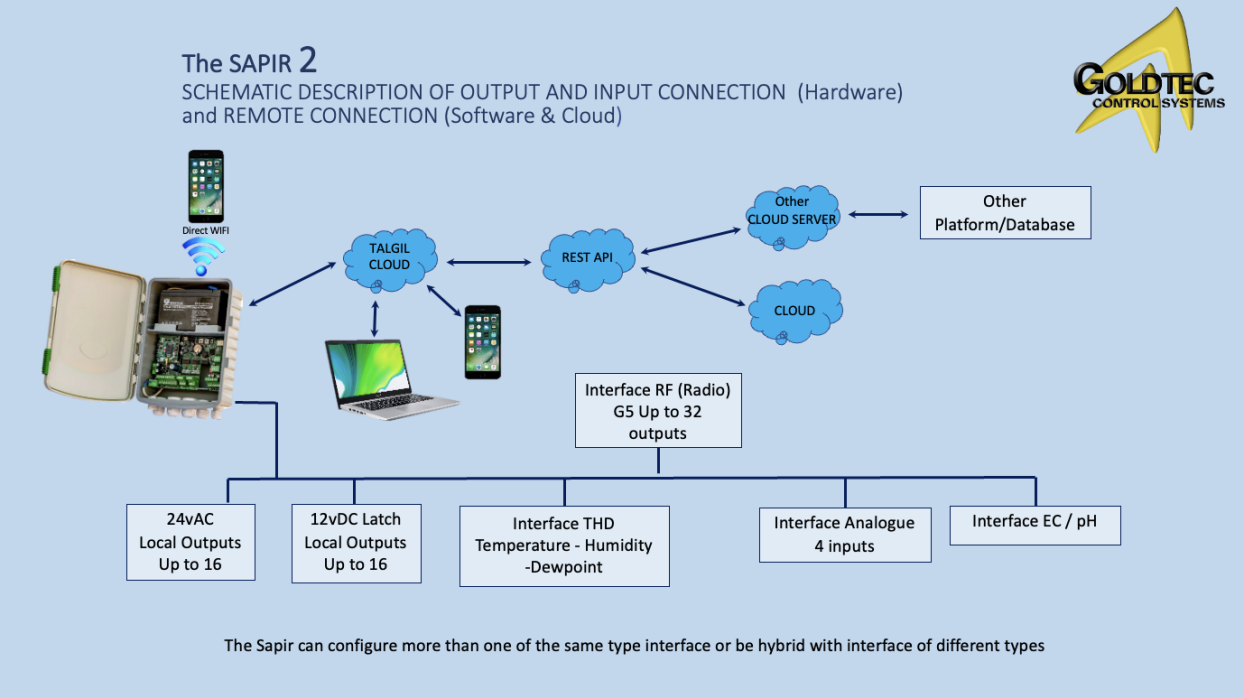
- Water meter -1
- Free water meters -8
- Pressostat -1
- Fertilization meters -4
- DP-1
- Contacts-16
- Analog inputs -48

Sapir 2 Configuration	
Sites	**Max Quantity**
Irrigation line	1
Local Fertilization site	1
Local Filtration site	1
Digital Inputs	
Line Water meter	1
Free water meters	8 *
*** 1 Line water meter + 7 free water meters Or 8 free water meters.**	
Fertilization meters	4
Pressure meter	1
DP	1
Contacts	16
Maximum Total number of digital inputs	30
Analog inputs	48

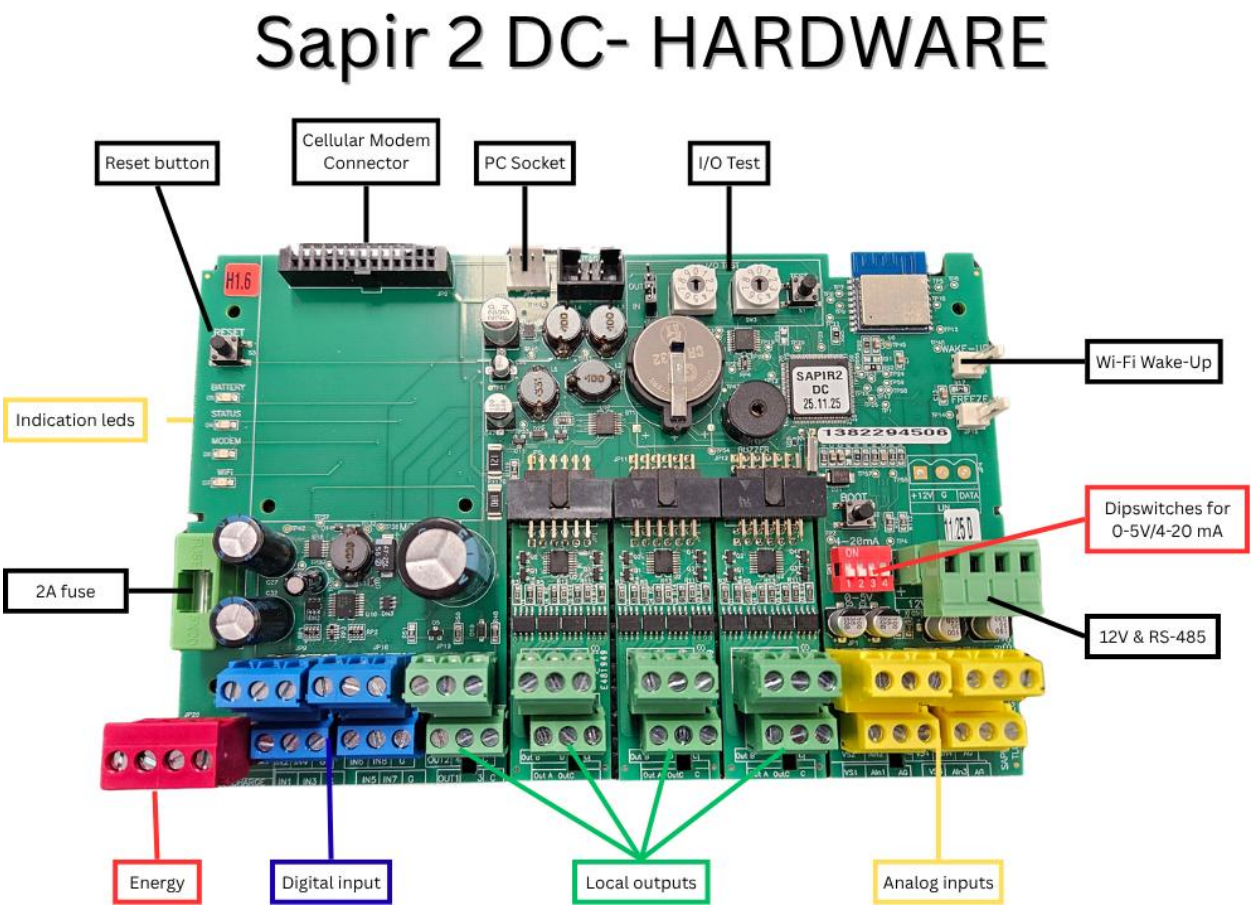
3

2. The system structure

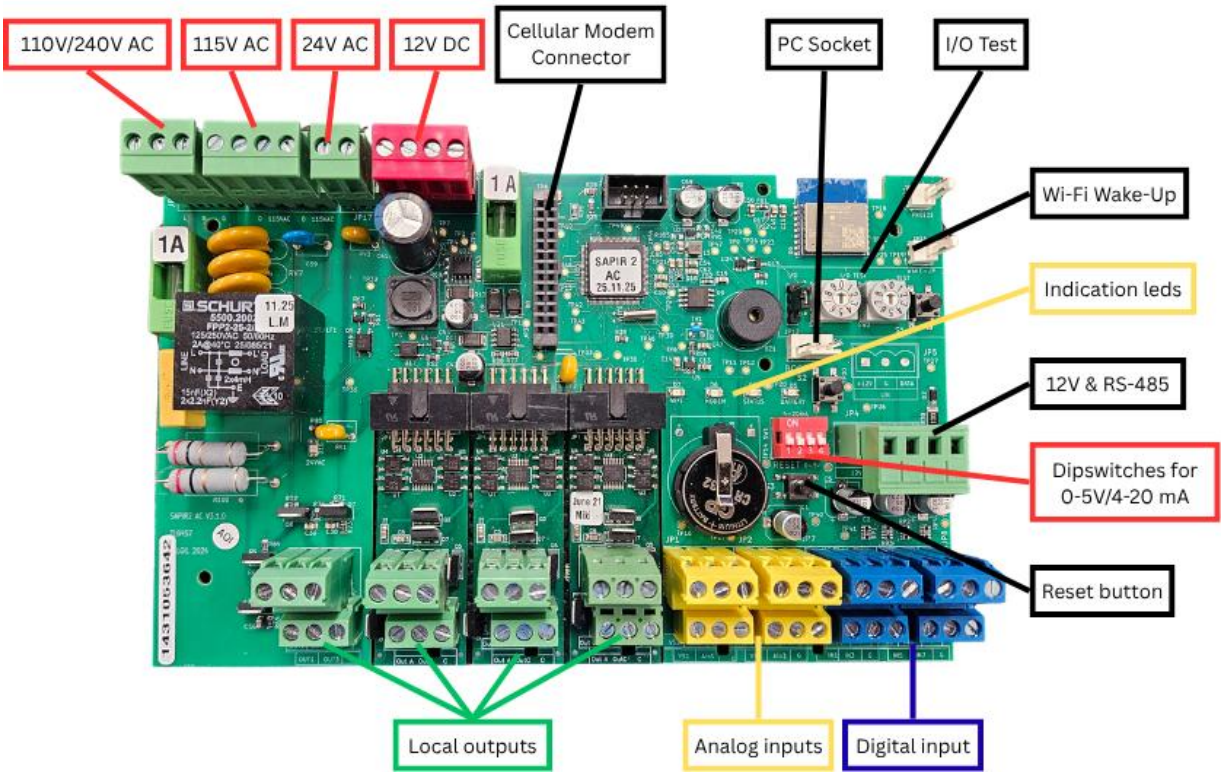
The following chapter contains a short explanation of the system structure.



2.1 Hardware


Sapir 2 DC- HARDWARE
Reset button
Cellular Modem Connector
PC Socket
I/O Test
Wi-Fi Wake-Up
Indication leds
Dipswitches for 0-5V/4-20 mA
2A fuse
12V & RS-485
Energy
Digital input
Local outputs
Analog inputs

Sapir 2 AC- HARDWARE



Interfaces - The following schema describes the principal structure of the SAPIR 2 interfaces system.

The interfaces function is to communicate between the external I/O devices such as – RTU's, analog sensors, weather station…. and the CPU.

Note – the on board local I/O's doesn't have an external interface, it's included in the SAPIR 2 board hardware and software.

For example – the steps of an opening command to valve number 3, which is connected to RTU RF number 2 in output 1:

1. The CPU will send the opening command to the interface / master RF.
2. The interface / master RF will send the command to RTU number 2.
3. RTU number 2 will open output 1.

When use digital or analog sensor, the same logic works but the other way around, meaning that the sensor is connected to an input in the RTU and when the sensor send a signal to the RTU, it sends it to the interface and the interface to the CPU.

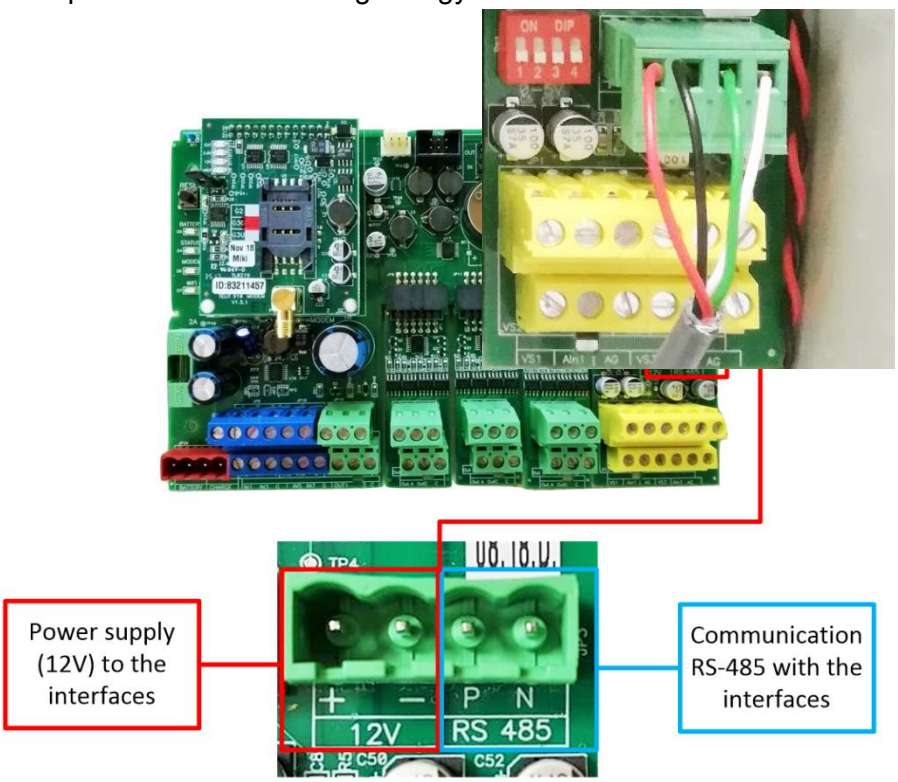
Communication with the physically connected external interfaces is done by RS-485 communication protocol.

3. How to connect the interfaces

All the external interfaces will connect to the same terminal in the SAPIR2, the terminal is devided in two, the left part is made to supply energy (12V) to the interfaces and the right part is for communication (RS-485). Polarity is important when conecting energy and communicaation to the intrfaces.

All the interfaces will be connected by communication (RS-485) cable to the SAPIR2, but **NOT** all of them will be energized from it, it's depend on the interface type and installation distances from the **SAPIR 2**. if the interface is installed near the controller it can be energized be the **SAPIR 2**, if not the interface should be energized from a local power supply such as charger or solar panel and rechargeable battery.

Note – interface **2 WIRE** will be powered always from an external power supply and never directly from the **SAPIR 2** 12V terminal.



Wiring the interfaces terminal in the SAPIR2:

Note: All wiring in the above terminal should be connected in the same way in the interfaces.

- Make shore to set the interface address number exactly like in the **SAPIR 2** image.

4. Mounting the controller

The SAPIR 2 can be installed indoor or outdoor:

- Make sure that the modem antenna is outside the box, and located in a high and visible place.
- Make sure to close the controller box when living the site.

5. Energizing the controller

The SAPIR 2 can work with both energy sources AC and DC, the decision if it will work with AC or DC should be taken before purchasing the controller and depends on the outputs (24VAC/ DC latch) and energy source on the installation site.

5.1 DC

10-Watt Solar panel and 12V / 9 / 3.3Ah rechargeable battery (depends on the box).

Solar panel and rechargeable battery connections:

1. Connect the solar panel to the **CHARGE** input **- NOTICE THE +/-**
2. Connect the rechargeable battery to the **BATTERY** input **- NOTICE THE +/-**

18V Charger and rechargeable battery connections:

1. Connect the 18V charger to the **CHARGE** input **- NOTICE THE +/-**
2. Connect the rechargeable battery to the **BATTERY** input **- NOTICE THE +/-**

- **18V Charger –** in order to connect the SAPIR 2 DC to a the mains, a 18VDC charger is needed, the charger should be connected to the **CHARGE** input due to the controller special charging mechanism

5.2 AC

220V / 110V AC directly from the mains and a 12 V / 9 / 3.3 Ah rechargeable battery 220.

220V / 110V AC directly from the mains connections:

1. Connect the socket to the mains
2. Connect the rechargeable battery to **BATTERY** input **- NOTICE THE +/-**

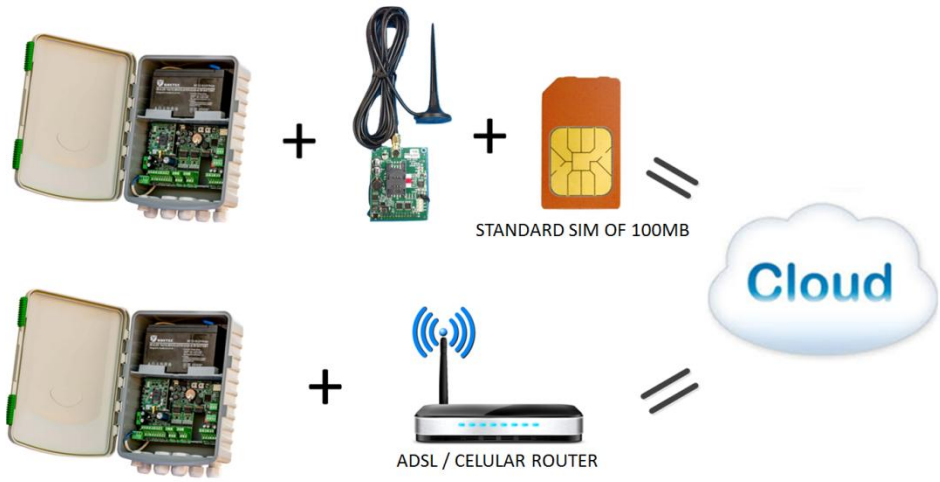
6. Communication

6.1 – Connection to the server

Connecting the controller to the server allows the user to program and monitor the controller from everywhere at any time, moreover, it allows to multiples users access to a certain controller and / or access with a certain user name to multiples controllers.

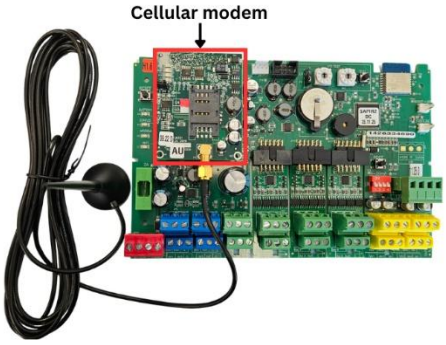
All the communication between the users pc / smartphone and the controller is happening in the server (except while using WIFI direct), for example, if a user changes a certain irrigation program from his computer using the CONSOLE, the changes are done in the server, and the information passes to the controller.
In addition, all the information from the controller (online controller) is saved in TALGIL's server (cloud).

There are 2 ways to connect the SAPIR 2 to TALGIL server, first one is by cellular modem and a sim card with data package (at least 100Mb), and the second one is by connecting to the local Wi-Fi net.



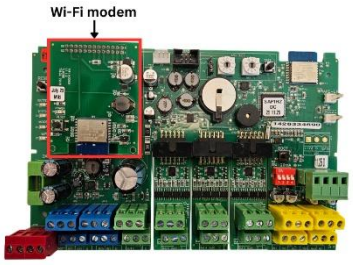
6.1.1 – Cellular modem

In order to connect the controller to TALGIL's server, disconnect it from the power supply and rechargeable battery, open carefully the SIM card holder, place the SIM card in the right position and close the holder, to continue go to paragraph 6.



6.1.2 – WI-FI

The Wi-fi modem connection will be ready in Q1 of 2019.



7. Definitions for server connections

All server communication settings have been pre-configured prior to dispatch. For any technical questions or assistance regarding connectivity, please contact Talgil

In order to connect the Sapir 2 to the internet, the installer supposed to send several commands to the Sapir 2 controller. The commands define the connection to the server and cellular company settings.

There are two ways to send these commands. The first option is by sending SMS to the sim card which is installed in the Sapir 2 Modem.

The second option is by sending command via serial communication.

7.1 By sms

Before sending SMS to the Sapir 2 controller, ensure that the SIM Card includes Internet and SMS package. Ask your cellular provider what is the Data APN, Data APN Username, and Data APN Password. In order to set the cellular provider settings, the installer need to send commands by SMS to the SIM card phone number. Every SMS command starts with the password **.1234.** Every command accompanied by SMS message back for approval or answer message.

Data APN command:

The Data APN SMS command is: **.1234.apn APN**
for example, in order to set the timbrasil.br apn send the following SMS:
.1234.apn timbrasil.br (Pointer 1)

Data Settings	Value
Data APN	timbrasil.br
Data APN Username	tim
Data APN Password	tim

Data APN Username command:

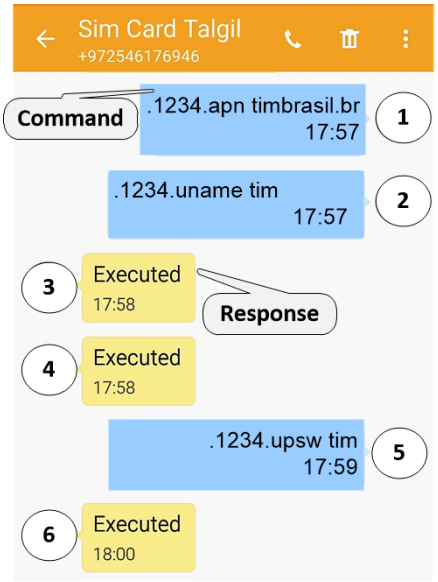
The Data APN Username SMS command is: **.1234.uname UNAME**
For example, in order to set the tim Data apn username send the following SMS:
.**1234.uname tim** (Pointer 2)

Data APN Password command:

The Data APN Password SMS command is: **.1234.upsw UPSW**
For example, in order to set the tim Data apn Password,
send the following SMS: **.1234.upsw tim** (Pointer 5)

Sapir 2 response to commands:

Pointers 3, 4, and 6 are the Sapir 2 response for the Data APN, Username, and Password commands.
Executed response means that the command has been accepted.



Set dealer name command:
The set dealer name SMS command is: **.1234.dealer DEALER_NAME**
For example, in order to set the **yaron** Dealer name, send the following SMS:
.1234.dealer yaron

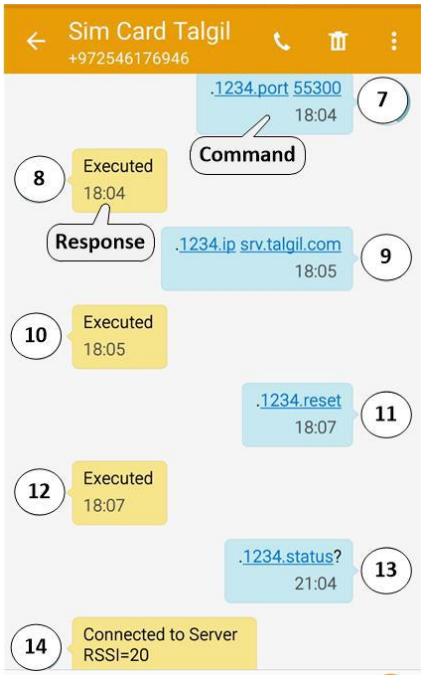
Reset command:
The reset SMS command is: **.1234.reset** (Pointer 11)

Controller connection to server status:
There is an option to ask the controller what is the status of Connection to the server.
For example, in order to check the Connection to server status, send the following SMS:

.1234.status? (Pointer 13)

The controller will send SMS back (Pointer 14)
With the current connection to server status
And the RSSI (Received signal strength indication) Level.
For example, pointer 14 is the controller response

Which display **Connected to Server** and **RSSI=20**



Commands list for settings the Sapir 2

ID	Command	Description
1	prompt on	Start listen to serial commands.
2	prompt off	Stop listen to serial commands.
3	status?	Display the Sapir connection to server status.
4	password 1234	Set password for commands trough SMS.
5	password?	Display password for commands trough SMS.
6	smsphone 0544763965	Define user1 mobile phone number to get an SMS about unit ID.
7	send sms 1	send SMS to user1.
8	smsphone?	Display user1 mobile phone number.
9	userphone 0544763966	Define user2 mobile phone number to get an SMS about unit ID.
10	send sms 2	send SMS to user2.
11	userphone?	Display user2 mobile phone number.
12	ip srv.talgil.com	Set the ip address to srv.talgil.com
13	ip?	Display the ip address.
14	port 55300	Set port number to 55300
15	port?	Display the port number.
16	apn internet	Set the apn.
17	apn?<CR><LF>	Display the apn.

18	uname user_name	Set the apn username.
19	uname?	Display the apn username.
20	upsw apn_password	Set the apn password.
21	upsw?	Displat theapn password.
22	dealer dealer_name	Set the Dealer name.
23	dealer?	Display the Dealer name.
24	i forgot password	Sends password to user1 and user2.
25	i forgot unit id	Not in use.
26	unit id?	Display the Sapir modem + CPU ID.
27	version	Display the Sapir firmware version.
28	restmodem	Reset the Modem.
29	reset	Reset the Sapir.
30	configinit	Set initial configuration (2 valves only).
31	time 27-4-20 16:00:00	Set manually the date and time to April 27, 20 time 16:00:00
32	time?	Display the Sapir current time.
33	clearlog 1	clears Row data.
35	clearlog 3	clears accumulations.
36	version?	Display the Sapir firmware version (like command 27).
37	idoption?	Display id option parameter
38	id option 0	Connect with MODEM ID
39	id option 99	connect with CPU ID
40	netname name	Set Wi-Fi network name
41	netname?	Display the Wi-Fi network name
42	netpsw_password	Change Wi-Fi network password 8 characters
43	netpsw?	Display the Wi-Fi network password?
44	fstart b	Upload beta version
45	boot	Enter into boot mode
46	modem 1	Set modem type to 3G
47	modem 2	Set modem type to 4G
48	modem ?	Ask the modem type.
49	gen 3	connect to 3G network.
50	gen 4	connect to 4G network.
51	gen?	Asks the generation (Answers: 3 (3G) or 4 (4G)).
52	erlog?	Returns error log.
53	rssi?	Returns the RSSI level.
	Sapir DC-Output signal settings	
54	solvolt?	Display the DC output voltage (default 160=16V)
55	solperiod?	Display the DC output period time (Defualt 90)
56	solvolt 160	Set the DC output voltage to 16V
57	solperiod 90	Set the DC output period time to 90 mSEC

58	**Sapir AC-Short and overload alarms**	
59	curshort 1000	Set the parameter to detect short circuit on Sapir AC to 1000
60	curovrl 700	Set the parameter to detect overload on Sapir AC to 700
61	curshort?	Display the parameter to detect short circuit on Sapir AC
62	curovrl?	Display the parameter of overload alarm detection
63	ac data?	Display Sapir ac parameters (average current and power supply)
64	ac problems	Display AC alarms (overload and shorted output).
65	clear shorted	Clears shorted alarm.
66	clear overload	Clears overload alarm.

7.2 By serial connection

Preparing Serial communication with the Sapir 2 controller:

The second option is to send commands using the serial communication. The serial communication software is **SerialTool**

Programming the Sapir 2 Controller using the SerialTool Software

1. Disconnect the power supply plug (Pointer 1 figure 2) from the **Sapir 2** controller.

2. Connect the **RF programmer** (2) device to the **PC** (3) and to the **PC Socket** (4) on the **Sapir 2** controller as described in figure 2.

3. Connect the power supply plug to the **Sapir 2** controller.

4. Open the **Serial tool V1.11** software. If you do not have it, download it here (https://drive.google.com/drive/folders/1LnYjFsgmcl4iGiqDCN0ufBPboZzRdXFb?usp=sharing).
5. Select the appropriate communication port on the **Com** combo box (Pointer 1 figure 1). In order to find the **Com port,** go to **My PC** and press the right mouse button. Select **Properties->Device manager->Ports (Com & LPT).**

6. Click the **START** button (2).
7. To add a command to the **Command list**, write the new command in the **Command text box** (3). Press the **STORE** (4) button to add the new command to the **Command list** (5).
8. To send a command to the **Sapir 2** controller, stand on the preferred command on the **Commands list** (5) and double click on it.

9. The sent command and the **Sapir 2** response will appear on the Logging window (6).

Serial Tool Software

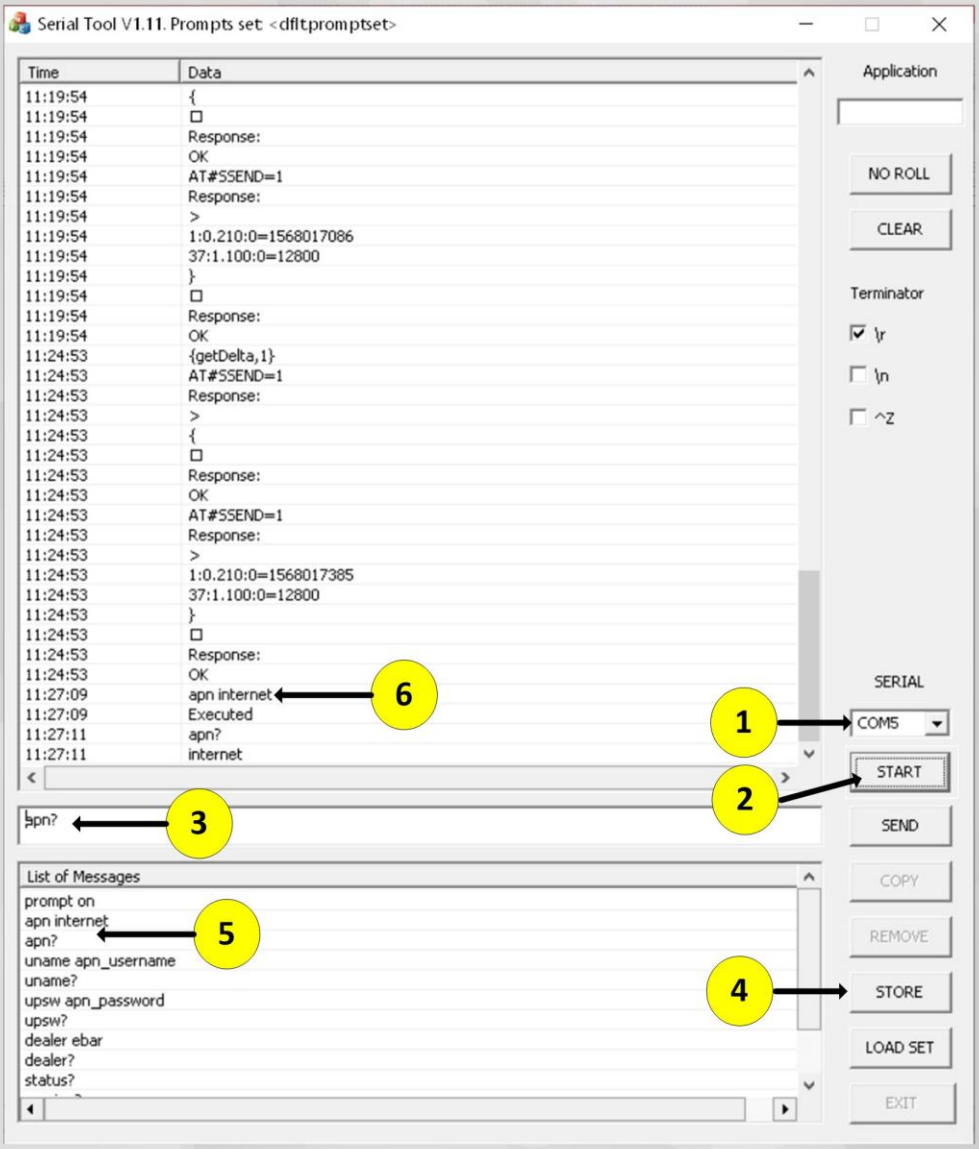


Figure 1- Serial Tool Software description.

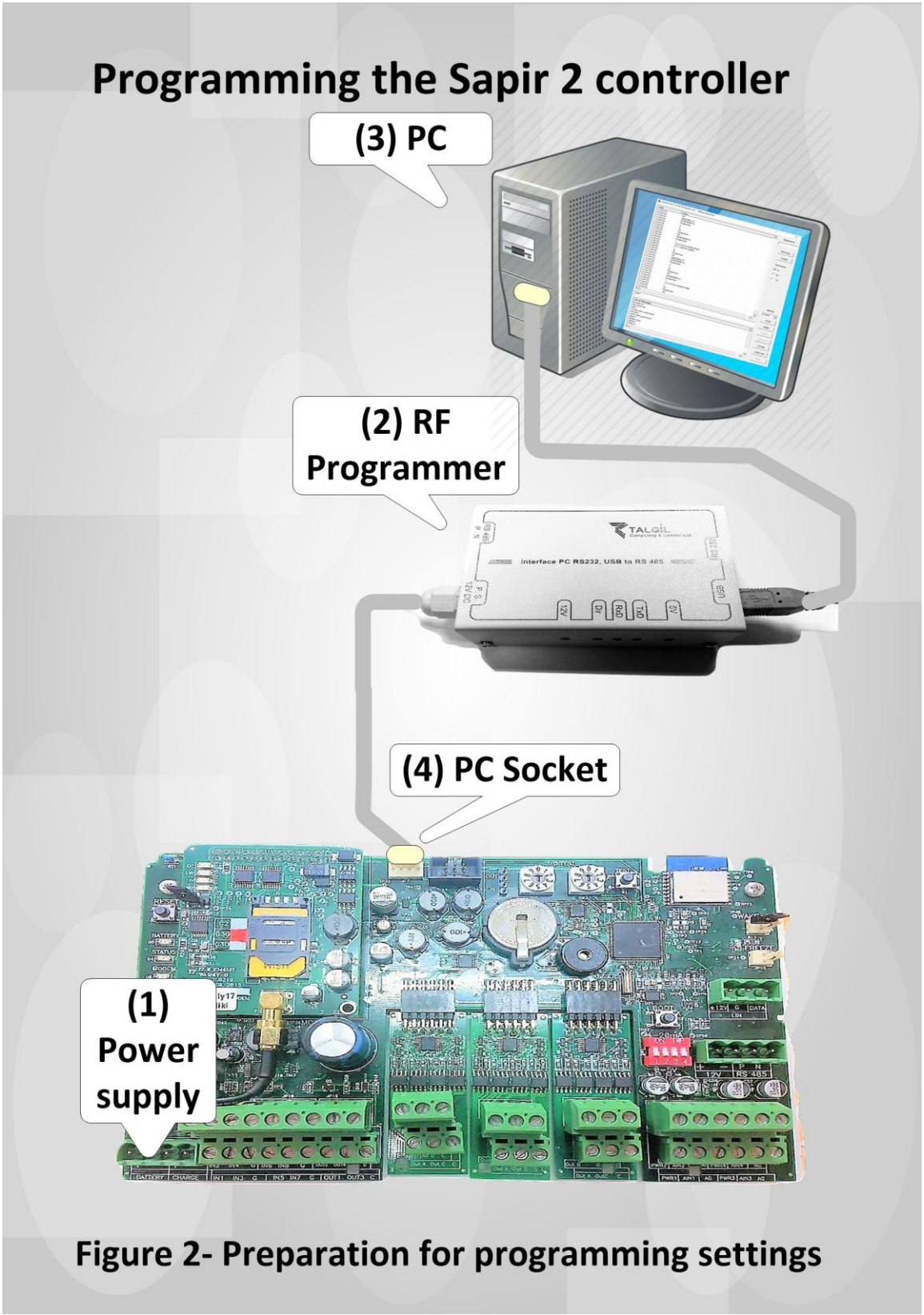


Figure 2- Preparation for programming settings

Indication LED’s status

A. **Battery LED status:**
   1. **Off:**
      I. **Dead battery.**
      II. **There is no power source connected.**

   2. **Blinking:**
      I. **Slow –** normal operation, without battery charging.
      II. **Long + 2 shorts –** Low battery.
      III. **Fast –** Battery charging problem.

   3. **On -** Normal operation, with battery charging.

B. **Status:**
   1. **Off -** Not active.

   2. **Blinking –** Slow, normal operation.

C. **Modem:**
   1. **Off –** Not active / connected.

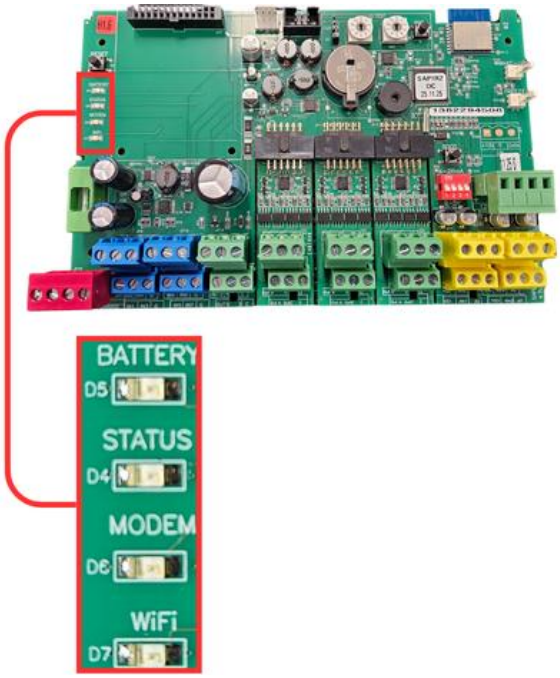
   2. **Blinking –** connecting.

   3. **On –** connected to the server.

D. **Wi-Fi:**
   1. **Off –** Not active.

   2. **Blinking –** Wi-Fi is active.

LED’S LOCATION ON THE



8. Communication with the controller

Communication with the controller is made by using 2 platforms, the first platform is the DREAM CONSOLE PC software (computers, laptops), and the second one is the SPOT app (smartphone, tablet).

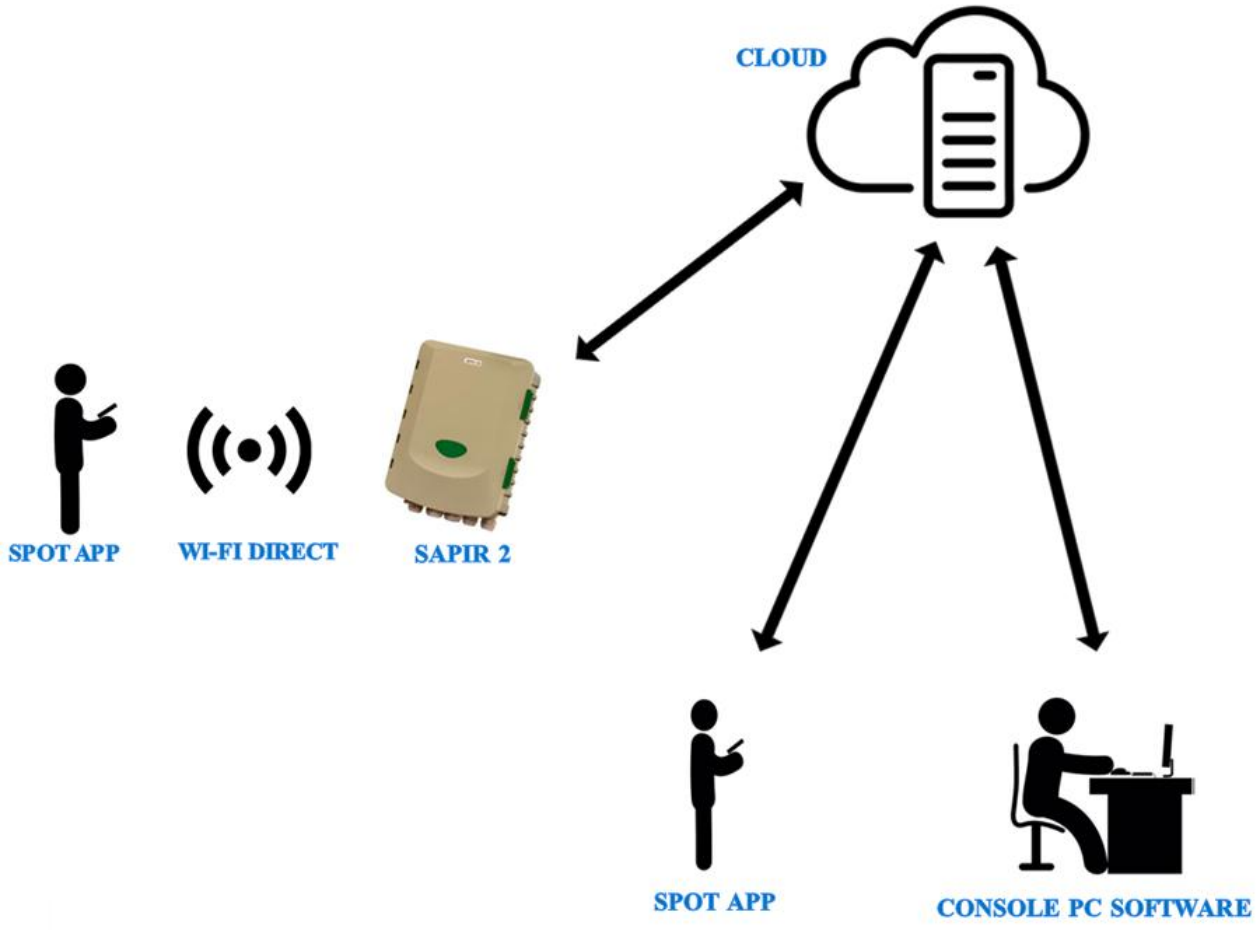
8.1 Available internet connection

When there is a solid internet connection both options (Console and Spot) are available, the installer MUST connect the controller to the internet in order to create the system configuration.

8.2 No internet connection

In case of no internet connection, only the SPOT app is available and will work only while the user is

standing near the controller and the internal WIFI component is turned on.



Note – there is no physical connection between the controller and the computer

9. First introduction with the console

9.1 What is CONSOLE?

The DREAM CONSOLE pc software is a platform that allows programming and monitoring the SAPIR 2 from any pc or laptop, the only requirements are internet connection of the controller and the computer, user name and password and downloading the software.

Using the software allows the user creating and editing irrigation programs, monitoring irrigation performance, graphical analyze of inputs (sensors water meters…), creating maps and so much more…..

9.2 Downloading

For downloading the CONSOLE software click here,
or enter our website **www.talgil.com**, after reaching to the home page, select:
Software ➡ **Console** ➡ **Download Console 64 bit** ➡ **and follow the installation instructions**.

10. First introduction and downloading

10.1 What is SPOT?

The DREAM SPOT application is a platform that allows programming and monitoring the SAPIR 2 from the user's smartphone or tablet,

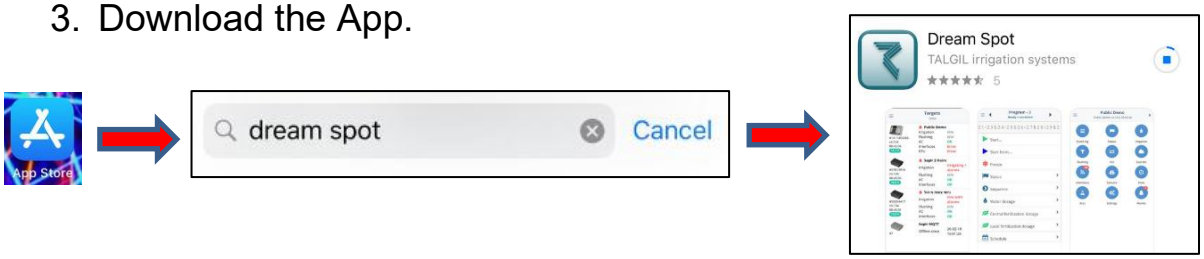
The App allows the user to create and edit irrigation programs, monitor irrigation performance, analysis of inputs (sensors water meters…), detailed event logs, and much more…

10.2 Downloading from the Android operating system

1. Enter the **"Play Store"** App.
2. Write on the search bar – **dream spot**
3. Download the App.

10.3 Downloading from the IOS operating system

1. Enter the “App Store”.
2. Write on the search bar – dream spot.
3. Download the App.



For further information please refer to:
“SAPIR 2 - CONSOLE User Manual” / “SAPIR 2 - SPOT User Manual”