# Ingeteam

# **INGECON SUN MANAGER**

**User Software Manual** 

Ref: AAX2005IKL01 Rev: \_A



**Note:** In its commitment to ongoing product improvement, Ingeteam Energy S.A. reserves the right to amend this document with no prior notice.

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## Related documentation

#### CATALOGUES



#### MANUALS



AAS2002IKI01



## 1 INTRODUCTION

PV plants incorporating Ingecon® Sun inverters and accessories require a software program to enable all the system variables to be controlled from a single computer.

This document refers to the following PC program: Ingecon®Sun Manager

## **1.1 Hardware and Software Requirements.**

In order to use the Ingecon® Sun Manager, the following is required:

A PC with either Windows® XP, Windows® Vista or Windows® 7.

And, depending on the type of communication system used:

- A vacant serial or USB port
- Ethernet communication board.
- Internet connection for communication via GPRS.
- Connection through an external modem via GSM.

## 1.2 Usage regulations

#### Copyright

The Ingecon<sup>®</sup> Sun Manager software is the property of Ingeteam Energy, S.A.



## 2 INSTALLATION

- Download the software from the Ingeteam website at <u>www.ingeteam.es</u> or <u>www.ingeteam.com</u>
- Execute the Setup.exe file and start the installation procedure.
- Follow the installation instructions.



## 3 START-UP

#### 3.1 Language

From the file menu "File", go to select language "Choose language" to select one of the languages available: Spanish, English, German, Italian, French or Czech.



## 3.2 Plant selection.

The software and its folder structure make it possible to work with a number of PV installations through a single PC.

The first step is to create the PV Plant to work with. Right click on PLANTS to access a pop-up menu which will allow a new plant to be added, and which must be assigned a name.



<u></u> Ingec	on® Sun	Manager 1.4							
File	OnLine	Reading	Data List	Graphics	Full Screen	<b>?</b> Help	Ingetean	n	
×		Add plant							
State :	Des	conectado			Last Comm	unication :	Inactiva		
<u></u> Ingec	on® Sun	Manager 1.4							
File	OnLine	Reading	Data List	Graphics	Full Screen	<b>?</b> Help	Ingetean	n	
F	PLANTS Ingetea	m Energy							
				Connection c Total energy (	reation date kWh)	13/05/2010			
					Plant config	uration (commu	nications)		
				GPRS	CUM  GSM  E	Ethernet		[	
				POR	• [	Device ma	anager		
					_			Connect	
1	- 11								

An existing plant can be deleted by right-clicking on that plant and then selecting the delete plant option. Alternatively, select the plant and then press the "Del" key. In either case a user message will appear on screen to indicate that the data will be deleted.



💥 Ingecon 🖲	) Sun Manager 1.4			<u>-   ×</u>
File Of	nLine Reading Data List	Graphics Full Screen Help	Ingeteam	
	ITS rgeteam Energy Add plant Delete plant Rename plant	Connection creation date 13/05/2010 Total energy (KWh) Plant configuration (commun GPRS COM GSM Ethernet IP 88.63.64.9 TCP Port 7128	ications)	
State :	Desconectado	Last Communication :	Inactiva	

As can be seen in the figure above, it is also possible to rename the plants created. This is done by selected the rename plant option **Delete plant**.

#### Change plant.

Once you are connected to a plant to go to another plant simply select the file menu **File** and click on the change plant option **Change plant**.



<b>X</b> Ingec	on® Sun Manager 1.4		_ <b>_ _ _ _ _</b>
File		ist Graphics Full Screen <b>? Ingeteam</b>	
	hange plant fork off-line hoose language → kit	Connection creation date 13/05/2010 Total energy (KWh)  Plant configuration (communications)  GPRS_COM_GSM_Ethernet  IP	
State :	Desconectado	Last Communication : Inactiva	

## **3.3** Configuring the communication link.

When the Plant name is selected, the Plant configuration parameters will be displayed on the right-hand side of the screen. These parameters should be changed to suit the communication link available at the Plant.

The Communications Configuration window has four tabs. The first tab is for the GPRS configuration, the second is for the serial port, the third is for the GSM communication link and, finally, the fourth is to configure the Ethernet parameters.



#### 3.3.1 GPRS Communications

GPRS communications is made with the modem, which requires a SIM card and a contract with a telecommunications operator. This modem is accessible from any computer with Internet and the Ingecon Sun Manager. Considering the amount of inverter data to be downloaded, just over a few tens of Mb, the Movistar "M2M Voice" is the most suitable service if the modem is also to be uninterruptedly connected to the Internet. "Voice" is required to send SMS alarm messages, as the SMS service is not included in "M2M Data". Normally the modem internet IP address is dynamic, however operators do also offer fixed IP addresses.

In any case, keep a check on your SMS consumption and consult your telecommunication operator's customer service regarding the best rates available.

In the same way as for the GSM modem, you need to disable the PIN code request on the SIM card.

💥 Ingecon® Su	n Manager 1.4								
File OnLin	e Reading	Data List	Graphics	Full Screen	? Help	Ingetear	m		
State : D	am Energy		Connection or Total energy ( GPRS ) P se C U C U Serr Use Pas Mod	eation date KWh) Plant config COM GSM I lection Dynamic IP See IngerasPV FTF se another FTP ver r sword lem serial num Last Comm	13/05/20 uration (comm Ethernet ) Date pote f f f f f f f f f f f f	I0  unications)  Static IP  Connecting via 3G  pingeraspv.ingeras es  FSAIENRSUJLA  ISAIENRSUJLA  ISAIENRSUJLA	Conne Work of	oct	

#### 3.3.1.1 GPRS with a dynamic IP

Each time the modem connects to the Internet, the telecommunications operator assigns it a new IP address, which does not necessarily coincide with the one assigned



during an earlier connection. For this, Ingeteam offers the ftp server ftp.ingeraspv.ingeras.es. When using a dynamic IP, you need to complete the following fields: Server (the server ftp address for authentication in order to obtain the dynamic IP); User; and Password. You also need to indicate the serial number of the modem to be used for communicating with the inverters. If the server used is the one offered by Ingeteam, then the user number and the modem serial number are the same, as shown in the following figure.

## 3.3.1.2 GPRS with a static IP

Ask your telecommunication operator's customer service about the possibility of obtaining a fixed IP for your modem. In this case, you simply need to enter the IP in the appropriate field.



### 3.3.2 Serial Port Communication.

For serial port communications, you need to select one of the COM ports available on the PC for the connection.

<b>X</b> Ingec	on® Sun M	anager 1.4							IX
File	OnLine	Reading	Data List	Graphics	Full Screen	<b>?</b> Help	Ingeteam	1	
File	UNTS Ingeteam	Reading	Data List	Connection or Total energy ( GPRS Port	Full Screen eation date kwh) Plant conf CDM GSM :	Help 13/05/2010 iguration (communi- iguration (communi- iguration (communi- commu	sations)	Connect Work offline	
State :	Desc	onectado			Last Com	munication :	Inactiva		



## 3.3.3 GSM phone communication

The GSM tab is to select a data call communication system from the modem through the GSM network. To configure this option you need to enter the modem phone number.

<b>X</b> Ingec	on® Sun M	anager 1.4							
File	OnLine	Reading	Data List	Graphics	Full Screen	<b>?</b> Help	Ingeteam	1	
Conter.	LANTS Ingeteam	Energy		Connection or Total energy ( GPRS   Port Tele	eation date (kWh) Plant conf COM GSM phone	13/05/2010 iguration (communi Ethernet ) [COM13o Device man [620666123]	cations)	Connect Work off-line	
State :	Desci	onectado			Last Corr	munication :	Inactiva		



#### **Ethernet Communication**

Use this option if your inverter is equipped with the Ethernet communication card, or if an RS485 / Ethernet converter has been connected to the RS485 bus formed by its inverters. The following parameters need to be configured: IP address; and the port used to configure this equipment to accept TCP clients.

<b>X</b> Ingecon	n® Sun Manager 1.4							
File C	OnLine Reading	Data List	Graphics	Full Screen	? Help	Ingeteam		
	Ingeteam Energy		Connection c Total energy I GPRS   IP TC	reation date (kw/h) COM   GSM P Port	13/05/2010 iguration (commun Ethernet   188.63.64.65 7128	ications)	Connect Work off-line	
State :	Desconectado			Last Corr	imunication :	Inactiva		

#### 3.4 Offline mode

Use this option when you want to work with plant data without being connected.

#### 3.5 Disconnection

Allows you to disconnect from the plant.



## 4 Working with the plant

Once the communication has been configure, you can work either with or without a connection.

For working without a connection, double click on the Plant you want to work with or else select a plant and click on the work without connection button "**Work off-line**". For working whilst connected, select a plant and click on the connect button "**Connect**".

If you are working whilst connected, the following screen will be displayed.



Right-click on the plant name on the left-hand panel and the pop-up menu displayed will allow you to add an Ingecon, which is the generic name used to define an inverter type machine which can either be three phase, single phase, hybrid or a string monitor.



Following the same procedure as for the Plants, a value needs to be entered and which must be between 1 and 247. If the node responds, the icon turns green, otherwise it will turn red. In this latter case, this may be because the node does not exist in your network or it may indicate a communication problem with that node.



#### 4.1.1 Serial number and Firmware.

The serial number and firmware code for the Ingecons can be obtained by simply positioning the mouse pointer over an Ingecon.



0110006	45001/0001040 00	•	Last Update	13/05/2010 9:01:15		
	45C01(AA51540_N)		Ingecon	1		
			Date	13/05/2010		
			Time	09:05:18		
			Total energy injected to the grid (TotE)	24388	kWh	
			Total operation time (Op.T.)	5255	Horas	
			Total number of grid connections (Num. Con)	571		
			Alarms status	0x0000		
			Photovoltaic module voltage (Vdc)	552	DC Volts	
			Photovoltaic module current (Idc)	5	DC Amps	
			Phase 1 voltage (Vac1)	223	AC Volts	
			Phase 2 voltage (Vac2)	223	AC Volts	
			Phase 3 voltage (Vac3)	228	AC Volts	
			Phase 1 current (lac1)	4	AC Amperes	
			Phase 2 current (lac2)	4	AC Amperes	
			Phase 3 current (lac3)	4	AC Amperes	
			Phi Cosine (Phi Cos)	1		
			Phi Sine Sign (Sign. Phi)	+		
			Output power (Pac)	2730	Watts	
			Grid frequency (Fac)	49,00	Hertzs	



## 5 Plant pop-up menu

Right-click on the plant tree zone and the following pop-up menu will be displayed. This menu gives a series of options.

🔆 Ingecon®	Sun Manager 1.4 ###: Inge	eteam Energy :##	##			
File On	Line Reading Data List	t Graphics F	Full Screen Help	Ingete	eam	
E 🎘 Ingete	am Energy	Last Update	l.	13/05/2010 9:01:15		
	Ingecon® Sun settings			1		
	Partial Counters Reset		2	13/05/2010		
	Extra data settings			09:05:18		
	Parts that Oath a data		injected to the grid (TotE)	24388	kWh	
	Periodical Online data		on time (Op.T.)	5255	Horas	
	Delete Ingecon		r of grid connections (Num. Con)	571		
	-	Alarms statu	\$	0x0000		
	-	Photovoltaic	module voltage (Vdc)	552	DC Volts	
	-	Photovoltaic	module current (Idc)	5	DC Amps	
	-	Phase 1 vol	tage (Vac1)	223	AC Volts	
	Phase 2 v		tage (Vac2)	223	AC Volts	
	-	Phase 3 vol	tage (Vac3)	228	AC Volts	
	-	Phase 1 cur	rent (lac1)	4	AC Amperes	
	-	Phase 2 cur	rent (lac2)	4	AC Amperes	
	-	Phase 3 cur	rent (lac3)	4	AC Amperes	
	-	Phi Cosine (	Phi Cos)	1		
	_	Phi Sine Sig	n (Sign. Phi)	+	-	
	-	Output powe	er (Pac)	2730	Watts	
		Grid frequen	cy (Fac)	49,00	Hertzs	
State :	Conectado		Last Communication :	CRC OK		



## 5.1 Add inverters

<b>X</b> Ingeco	n® Sun M	1anager 1.4 ###: Inge	team Energy :###				 x
File		Reading Data List	Graphics Ful	I Screen Help	Ingete	eam	
🗉 🌞 İn	getean Fr	Synchronization of all Inc	ecop® Sup		13/05/2010 9:01:15		
		- Synchronization of all ing			1		
		Modem Configuration			13/05/2010		
		Periodical Online data			09:05:18		
		Add Ingecon		ected to the grid (TotE)	24388	kWh	
		Add multiple Ingecons		time (Op.T.)	5255	Horas	
			Total number o	f grid connections (Num. Con)	571		
			Alarms status		0x0000		
			Photovoltaic m	odule voltage (Vdc)	552	DC Volts	
			Photovoltaic m	odule current (Idc)	5	DC Amps	
			Phase 1 voltag	je (Vac1)	223	AC Volts	
		Phase 2 volt		je (Vac2)	223	AC Volts	
			Phase 3 voltag	je (Vac3)	228	AC Volts	
			Phase 1 curren	nt (lac1)	4	AC Amperes	
			Phase 2 curren	nt (lac2)	4	AC Amperes	
			Phase 3 curren	nt (lac3)	4	AC Amperes	
			Phi Cosine (Phi	i Cos)	1		
			Phi Sine Sign (	Sign. Phi)	+		
			Output power (	Pac)	2730	Watts	
			Grid frequency	(Fac)	49,00	Hertzs	
State :	Cone	ectado		Last Communication :	CRC OK		

Left-click on any of the Ingecons and the following pop-up menu will be displayed.

#### 5.1.1 A single Ingecon® Sun

Double click on any of the Ingecons to obtain the Online parameters shown in the figure above. The Enter key can also be used to the same effect.

#### 5.1.2 All the Ingecon® Sun

Double click on the Plant (in the case of the figure above "Plant 1") to botain a list of online parameters for each of the Ingecons connected to the Plant.



💥 Ingeo	on® Sun Ma	anager 1.4 ;	###: Ing	geteam B	inergy :###												_	
	0	PH -	Σ			. ?	1	nnet	ear	n								
File	OnLine	Reading	Data Li	st Gra	phics Full S	Creen Help		nget	Cur									
	ngeteam Ener	gy		Three	-phase													
	2 4				Serial	Last Update	Ingecon	Date	Time	TotE	Op.T.	Num. Con	Alarms status	Vdc	Idc	Vac1	Vac2	Vac3
				•	011080645C81	13/05/2010 9:01:15	1	13/05/2010	09:05:18	24388	5255	571	0x0000	552	5	223	223	228
					011080746C37	13/05/2010 9:05:32	4	13/05/2010	09:09:46	23811	5517	596	0x0000	582	5	228	227	232
				•														
State :	Conec	tado			L	ast Communication :		CRC OK										

Each line gives the data for one Ingecon. The background colour indicates the percentage of the maximum power being delivered by the Ingecon in question.

COLOUR	PERCENTAGE (%)
Red	<20
Orange	20 - 40
Yellow	40 - 60
Green	60 - 80
Cian	>80

#### 5.1.3 Continuous online data

This function provides a continuous read-out of the inverter online data.



#### 5.1.4 Synchronisation of the Ingecon Sun inverters

The user is asked whether he would like to go ahead and send the time and date to all the Ingecons:



A message then confirms that this synchronisation has been sent

#### **5.1.5** Configuring the Modems

This menu serves to configure the reports and alarms that the modem can send by SMS (short text messages by mobile phone). Consult the Communication Accessories Manual AAX2002IKH01 for more details on GPRS communication.

<u>Reports:</u> These can be generated on a daily, weekly or monthly basis and contain the energy production figures for the period in question.

<u>Alarms:</u> To provide real-time warnings of any system incidents.

# 5.1.5.1 Configuring the alarms, configuring the GPRS and configuring the telephones (1-4)

Inverters Here the number of inverters at the plant should be indicated.

<u>Surveilance interval</u> This field is to indicate the time interval in minutes at which the inverter housing the modem makes a status query to the other inverters.

<u>Test message</u>. An option to enable a test message to be sent from the modem, once the modem configuration has been completed. This serves to check that the modem is operating correctly.

For the modem to trigger an alarm, the cause must be sufficiently serious.



<u>Minutes with alarm in inverter.</u> Minimum duration in minutes required for an inverter alarm to be considered serious enough for a message to be sent from the modem.

<u>Minutes with alarm at tracker</u> Minimum duration in minutes required for a tracker alarm to be considered serious enough for a message to be sent from the modem.

<u>Number of communication errors</u> Minimum number of communication errors required to trigger an alarm message from the modem.

<u>Grid connections.</u> Number of network connections a day considered to be a network connection problem. An alarm message will be triggered.

- 🗆 🗵 ® Sun 1anager 1.4 ###: Ingeteam Energy :### Reading ? Help h 0 Σ --Ingeteam File Graphics OnLine Data List Full Screen Ingeteam Energy Send 02M081214A77 AAX1000\_F Read 2↓ 0 1.Alarm Settings 10 Grid connections Inverters Minutes with alarm in Inverter Minutes with alarm in Tracker 60 60 Number of communication errors 10 Surveillance interval (Shot period) in minutes – False est message E 2.GPBS APNPW (password) APNSERV (access point) ibox.tim.il APNUN (user) Enable GPRS communication True Language for SMS messages Use custom APN parameters 3.Telf1 Italiano True Communication alarm True True Grid connection alarm True Inverter Alarm Tracker Alarm True False False Daily report \* Monthly report \* Weekly report False 3929089120 Telephone ⊟ 4.Telf2 ! Communication alarm False LEatal Error False False Grid connection alarm ! Communication alarm If enabled, the modem will send an SMS on communication error alarm detection State Conectado Last Communication : NO REPLY

The modem is able to send SMS alarms to up to four mobile phones.

For each of these phones, you need to select the time interval for the reports and the type of alarms to be communicated.

#### 5.1.6 Configuring the GSM Modems

This is the same procedure as for the GPRS modem configuration, except for the fact that there is no GPRS tab.



### 6 Ingecon Pop-up Menu

### 6.1 Ingecon Sun Configuration

This displays the Configuration Panel. Click on the read button **Read** for a read-out of the configuration of the Ingecon selected.

Once read, any user-entered changes will be indicated in body type. Click on the send button **Send** to send the changes to the Ingecon.

Ingeco	on® Sun Manager 1.	4 ###: Ingeteam Energy :###	#			
File	OnLine Reading	Data List Graphics Fu	Ill Screen Help	Ingetee	am	
E 🌞 In	geteam Energy		Read	Send		
		E 2↓ ■	P		r	
		I 1. Ingeteam	linutes)			
		Latitude (Latitude) (I Longitude (Leng-Ltr	Degrees) r) (Degrees)		41,8 6541,4	
		Manual Start / Stop			True	
		Datalogging time (M Datalogging time (Minu	<b>finutes)</b> utes)			
State :	Conectado		Last Communication :	CRC OK		

## 6.2 Resetting the partial counters

The partial counters can be zeroed at any time so required. To do so, the PC must be connected to the system.

Click on the accept button in the pop-up menu displayed after selecting the option to reset the partial counters of the Ingecon in question



## 6.3 Configuring Additional Data Items.

There is a list of data stored in the inverter. These data items are taken from the records obtained every 15 minutes from your Data-Logger.

In order to meet system-specific requirements, the Ingeteam monitoring programs have been designed to store up to 6 additional data items for each inverter.

Analog input card serves to provide the inverter with some additional electrical inputs to accommodate these new data items. For further details, refer to the communications installation manual The display of the new data items is fully user configurable through the tools menu **Tools**.

🔆 Inge	con® Sun Manager 1.4 ###	#: Ingeteam Energ	y:###					
File	OnLine Reading Da	Σ ata List Graphics	Full Screen Help	Ingete	eam			
•	Ingeteam Energy	▶ Última	actualización	13/05/2010 9:26:31				
	Ingecon® Sun settings		<u>}</u>	1				
	Partial Counters Reset			13/05/2010				
	Extra data settings			09:23:05				
			ergy injected to the grid (TotE)	3451	(kWh)			
	Periodical Online data		peration time (Op.T.)	2007	hours			
	Delete Ingecon		mber of grid connections (Num. Con)	427				
		Alarms	status	0x0000				
		Inverte	r Status	0xDEFD				
		Photov	oltaic module voltage (Vdc)	288	DC Volts			
		Photov	oltaic module current (Idc)	9	DC Amps			
		Bus vo	ltage (VBus)	330	DC Volts			
		Curren	(lac)	11	AC Amperes	nes		
		Tensió	n (Vac)	235	AC Amperes			
		Phi Co	sine (Phi Cos)	0,999				
		Phi Sin	e Sign (Sign. Phi)					
		Output	power (Pac)	2755	Watts			
State :	Conectado		Last Communication :	CRC OK				

Configuration example:



💥 Ingecon® Sun Manager 1.4 ###: Ing	geteam Energy :###	
File OnLine Reading Data Li	ist Graphics Full Screen Help Ingeteam	
File OnLine Reading Data Li	ist Graphics Full Screen Help	
State : Conectado	Last Communication : CRC OK	

The meaning of each field is given below:

**Input:** The number of the additional data item selected (EA\_1, EA\_2, EA\_3, EA\_4, PT100\_1, PT 100\_2). Each input offers a number of electric signal reception possibilities:

• EA\_1 admits:

Voltage signal in the range from 0 to10 Vdc, or

Current signal in the range from 0 to 20 mA.

• EA\_2 admits:

Voltage signal in the range from 0 to 10 Vdc, or Current signal in the range from 0 to 20 mA.

• EA\_3 admits:

Voltage signal in the range from 0 to 2 Vdc, or Current signal in the range from 0 to 20 mA.



• EA\_4 admits:

Voltage signal in the range from 0 to 0.4 Vdc, or

Current signal in the range from 0 to 20 mA.

• PT100\_1, PT 100\_2:

Are inputs for the direct connection of PT100 type resistors.

**Conditioning:** The electric signal entering the inverter can either be a voltage or a current signal.

Label: The name used for the data item displayed.

Units: The units in which the data item is represented.

**Equation:** Two operating points serve to define the relationship between the electrical signal (X) and the data item represented (Y).

In the configuration example above, input « EA\_1» is received by the first additional analog input. It comes from a radiation meter which offers a voltage output which takes the following values:

0 Vdc for an irradiance of  $0 \text{ W/m}^2$ .

10 Vdc for an irradiance of 1200 W/m<sup>2</sup>.

Values (X1-Y1) and (X2-Y2) define these two operating points.

#### PT-100 Input.

The normal operating range for a PT100 is -23 to 93 degrees Celsius (°C). The fields should be filled in as follows:

💿 Normal



*	Ingecon® Sun	Manager 1.4	###: Inget	eam Energy	:###					
		Reading	∑ Data List	Graphics	Full Screen	<b>?</b> Help	Ingete	eam		
	Ingeteam E	nergy		Sav Input: Units: Equatic X1 [ X2 ] X1 = Mir X2 = Ma Example: Y1 = Mir Y2 = Ma	e Dele	te	Y2 Y2 Y1 X Y/m²)			
S	tate: Co	nectado			Last Com	munication :	CHC OK			

The « Offset » field makes it possible to correct any measurement deviations caused either by the excessive length of the sensor cables or for any other reason. The value monitored shall be obtained from the following expression:

#### Value monitored = value measured + « Offset »

In exceptional circumstances, the system can be configured to operated at different temperatures.





This option requires hardware modifications which must be carried out to a specific monitoring configuration by personnel expressly authorised to do so.

#### Offset.



Save

To correct any possible sensor errors, a correction value can be added to the measurement temperature.

Therefore, if Offset = 1.2, then the monitoring program will display a temperature of 1.2 degrees Celsius ( $^{\circ}$ C) higher than the temperature detected by the sensor.

Offsel	t
1.3	2

Once the configuration has been completed, click on save: Save.

In this way the "Irradiance" variable has been included in the list of data items stored by the Data\_Logger. This makes it possible to perform an Online reading, store the data files and display them through list-outs or graphs.

To delete one of the data inputs, simply select it and click on the delete button: **Delete.** 



## 7 Data collection

To access the Read-out menu, once you have accessed the plant, select the read-out icon **Lectura**.



The following items will be displayed on the panel to the right of the Ingecon plant tree:

- Calendar.
- Progress bar.
- Logs.

#### Calendar

Use the calendar to select the days on which you would like to download data

<	ļ					>
lun	mar	mié	jue	vie	sáb	dom
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5
Ho	y: 20	)/07	/200	)7		

#### **Progress bar**

The progress bar indicates the data downloading status for each inverter and for each date given. When communication is via GPRS or GSM, if there is no data downloading activity over a long time interval, then a disconnection occurs. In this case, you need to select the archive, change plant option **File -> Change plant**, update the IP and reconnect.



#### Logs

The logs are text boxes displaying details of the downloads.



	$\wedge$
Ingecon 1: Comprobado número de serie 28/11/2007: Descarga Ok	
Ingecon 200: No se ha recibido la Respuesta del Ingecon® Su	

#### Types of downloads.

The downloads can be for either just one Ingecon® Sun or for all the Ingecon® Sun inverters.

#### All the Ingecon®Sun inverters

To download for all the Ingecon® Sun inverters, select the Plant name on the Ingecon tree and click on the accept button.

At the end of the downloading process, a screen should be displayed, similar to the one shown below.



*	Ingecon®	iun Manager 1.4	###: Inget	eam Energy	:###				
	File OnL		Data List	Graphics	Full Screen	<b>?</b> Help	Ingeteam		
	ingetez	m Energy.	[	Image: 100 pc           Image: 100 pc           26         27           3         4           10         11           17         18           24         25           31         1           Hoy: 25         25	Nayoo de 2010         Imié jue vie sáb           mié jue vie sáb         28 29 30 1           28 29 30 1         5 6 7 8           12 13 14 21 21         21 22           27 7 28 29           20 2 1 22         2 7 28 29           20 2 2 3 4 29           20 3 4 2000	2 9 16 23 30 6	Download	Clear window	
			H I	nverter (1) Da nverter (1) Da	te (18/05/2010) :Do	ownload Ok ownload Ok			
S	tate :	Conectado			Last Commu	unication :	CRC OK		

#### Just one Ingecon®Sun

The procedure is similar to the one described for All the Ingecons, except for the fact that, in this case, you should select an Ingecon from the Ingecon tree and click on the accept button.



## 8 Data List-outs

To access the List-out Menu, select the list-out icon **Listados** once you have accessed the plant.

$\Sigma$
Data List

The following items will be displayed on the panel to the right of the Ingecon plant tree:

- Calendar.
- Options.
- Parameters

#### Calendar

The calendar can be used to select the days on which a data list-out is to be provided. The days for which data are available for the selected Ingecon are shown in bold type. When several Ingecons are selected at the same time, then the data for the last Ingecon to be selected will be displayed. If all the Ingecons are selected, by clicking on the plant name on the Ingecon tree, then the days will not be displayed in bold type.

<	nov				007	>
lun	mar	mié	jue	vie	sáb	dom
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	<b>28</b>	29	30	1	2
3	4	5	6	-7-	8	9
Ho	y: 28	3/11	/200	)7		

#### Options

The user can list-out any of the following options for either the specific Ingecon selected or all the Ingecons.



- Data List ------© Daily data
- O Daily Gata
  O Daily Averages
- C Monthly data
- C Monthly Energies
- <u>Data list:</u> To display a data table for each day and for each Ingecon selected.

<b>X</b> Ingeco	n® Sun Manager 1.4	###: In	getean	n Energy :###									
File	OnLine Reading	Data Li	ist G	raphics Full Sc	F	<b>?</b> Help	Inge	team					
	leteam Energy T		Lun 26 3 10 17 24 31 Hoy ×2010/	mayo         de         2010           mar         mié         jue         vie         :           27         28         29         30         :           4         5         6         7         :           11         12         13         14           18         19         20         21           25         26         27         23         4           12         3         4         :         :           12         3         4         :         :         :           12         3         4         :	Sáb dom           1         2           8         9           15         16           22         23           29         30           5         6		Data List C Daily data C Daily Average C Monthly data C Monthly Energ Ok	is gies	Paramete All Temp (* Zac (ohr Date Vdc (V) Idc (A) Expor	ers C) n) t to Excel	×		
				Date	Vdc (V)	Ide (A)	Bus Vdc (V)	Vac (V)	Freq (Hz)	lac (A)	Pac (W)	Cos Phi	Temp (°C)
			•	12/05/2010 6:00	242	0	244	230	49,98	0	0	1	17
				12/05/2010 6:15	288	0,05	359	231	49,98	0,06	15	-0,998	17
				12/05/2010 6:30	259	0,55	320	232	49,97	0,65	137	-0,948	17
				12/05/2010 6:45	272	1,1	319	230	49,97	1,28	290	1	17
				12/05/2010 7:00	270	0,97	320	231	49,98	1,12	253	0,998	17
				12/05/2010 7:15	275	1,35	320	231	49,97	1,58	359	1	18
				12/05/2010 7:30	284	2,35	318	229	49,95	2,82	642	1	20
				12/05/2010 7:45	288	2,89	320	230	49,96	3,5	803	1	22
				12/05/2010 8:00	287	3,26	318	228	49,97	3,95	901	1	24
				12/05/2010 8:15	286	3,42	321	230	49,98	4,09	941	1	25
				12/05/2010 8:30	288	4,03	323	232	49,98	4,81	1116	1	26
				12/05/2010 8:45	288	4,82	323	231	49,98	5,77	1335	1	29
				12/05/2010 9:00	288	4,61	322	230	49,98	5,54	1277	1	24
				12/05/2010 9:15	289	6,25	320	229	49,98	7,59	1739	1	18
				12/05/2010 9:30	287	5,69	322	230	49,97	6,82	1572	1	24
				12/05/2010 9:45	286	8,56	327	234	49,97	10,07	2356	1	26
				12/05/2010 10:00	285	5,99	323	231	49,98	7,11	1642	1	18 💌
			•										
State :	Conectado			La	st Communica	ition :	CRC OK						

• <u>Daily averages:</u> To display a data table with the means for each day and for each lngecon selected.



<b>X</b> Inge	con® Sun Manager	1.4 ###: Inget	eam Energy	:###										<u>-     ×</u>
File	OnLine Readin	g Data List	Graphics	Full Screen	1	? Help	Ing	gete	am					
	Ingeteam Energy		Image         Image           26         27         28           3         4         5           10         11         12           17         18         19           24         25         26           31         1         2	de 2010 jue vie sáb d 29 30 1 6 7 8 13 14 15 1 20 21 22 2 27 28 29 3 3 4 5	2 9 16 23 30 6		Data List Daily C Daily A Month Month Ok	data Averages Iy data Iy Energies		Parameters	×cel			
		×2	Hoy: 13/05/ 010/5/12 (1) M	72010 4]										
			Date	Vdc (V)	Idc (A)	Bu	s Vdc (V)	Vac (V)	Freq (Hz)	lac (A)	Pac (W)	Cos Phi	Temp (*C)	Zac (ohr
				282	4,36	322	2	232	49,97	5,11	1193	0	20,67	0
		4												
State :	Conectado			Last Cor	mmunicatio	on :	CRO	сок						

• <u>Monthly data</u>: To display the data for all the days of the months for which information is available.



₩In	gecon® Sun I	Manager 1.4	###: In	getean	n Energy :	###									<u>_     ×</u>
File	onLine	Reading	Data L	ist G	<b>h</b> Graphics	Full Screen	? Help	Ing	etea	m					
	🤋 Ingeteam Er	ergy		Lun 26 3 10 17 24 31 Hoy ×2010/	mar mié 27 28 4 5 11 12 18 19 25 26 1 2 y: 13/05/	de 2010         ▶           ue         vie         såb         dom           23         30         1         2           6         7         8         9           13         14         15         16           20         21         22         23           27         28         29         30           3         4         5         6           2010/5/11-31         (1)         (2)         (2)	ц 11 м]	Data List C Daily dat C Daily Av C Monthly C Monthly Ok	a erages data Energies	Pa M Z D V V Id	rameters emp (°C) ac (ohm) ate to (V) c (A) Export to Exce	el			
					Date	Vdc (V)	Idc (A)	Bus Vdc (V)	Vac (V)	Freq (Hz)	lac (A)	Pac (W)	Cos Phi	Temp (°C)	Zac (d
				•	12/05/20	010 282	4,36	322	232	49,97	5,11	1193	0	20,67	0
				I											ł
Stat	e: Con	ectado				Last Comm	unication :	CRC	Ж						

- Monthly data
  - This is directed at selecting just one Ingecon in order to display the total energy figures for the days for which information is available in the current month and for the Ingecon in question.



💥 Ingecon® Sun	Manager 1.4 #	##: Ingete	eam Energy	:###	_			
File OnLine	Reading [	Σ Data List	Graphics	Full Screen	? Help	Ingeteam		
E Karan E	nergy	×20	Image         Image           Image         1           Image         2           Image         2           Image         1           Image<	de 2010 jue vie sab dom 5 30 1 2 6 7 8 9 13 14 15 16 27 28 29 30 21 22 23 27 28 29 30 3 4 5 6 2010/5/(1-31 (1)) nergy (Wh)	M <sup>×</sup> 2010/5	Data List         C Daily data         Daily Averages         Monthly data         Monthly Energies         0k         V(1.31 (1)) E	Export to Excel	
State : Cor	nectado			Last Commun	ication :	CRC OK		

#### Parameters

In addition, the user can select which parameters are to be listed-out from the following table and for the following options: Daily Figures, Daily Mean Figures and Monthly figures. (If no parameter is selected for the list-out, then no data will be listed out).

Parameters	
All	
Temp (*C)	
Zac (ohm)	
Date	
Vdc (V)	
Idc (A)	<b>_</b>

There is also the possibility of exporting the data to Excel. The data will be stored in the directory structure shown in the following figure (for inverter 1 of plant 1, you wil get an Excel File named Today.xls with the figures for today. For previous days, the file name has the following structure: (07 (year), 11 (month) 27 (day) and 001 (Ingecon number).



B Escritorio       ■         ■ Goumentos       ■         ■ Dingeteam       ■         <	~	B 071127_001.xks C 071127_001.xml C 0day.xks C today.xml	20 KB 4 KB 15 KB 2 KB	Hoja de cálculo de Documento XML Hoja de cálculo de Documento XML	28/11/2007 9:49 28/11/2007 9:38 28/11/2007 9:46 28/11/2007 9:38	
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#### The file contents will be as follows:

0	0 - 19 -	(~ - ) ∓						201021:	_4.xls - Mi	crosoft Exc	cel						- =	x
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Ρ	egar 🦪	N K S -	8- A	<b>\</b> -			Combinar	y centrar	- 🕎 -	% 000	*0 00 00 × 00	Formato Dar	formato	Estilos de	D Formato -	Orden	ar Buscary	
Port	apapeles 🛱	Fuente		5		Alineació	n		Gi I	Número	5	Es	tilos	celua u	Celdas	Mo	dificar	
	A1	(9	fx FIL	ETYPE: I	NGETEAM D	AILY AA	YV1									2. 2000		×
	Δ	В	C	D	F	F	G	н	1	1	K		М	N	0	P	0	T
1	FILETYPE: IN	SETEAM DAILY AA	YV1							1.00								f
-2	FIRMWARE	NGECON: AAY1000	E															1
3	SERIALINGE	CON: 110112341234																1
4	FECHA: 2010	/02/11																1
5																		
6		Fecha	Vdc (V)	Idc (A)	Vdc Bus(V)	Vac (V)	Frec (Hz)	lac <mark>(</mark> A)	Pac (W)	Cos Phi	Temp (°C	) Temperatur a C.I.	Energía Parcial	Estado Inv.	Estado Inv 2.	Alarma Inv.	Alarma Seg	
7		11/02/2010 8:00	170	3,35	170	233	49.94	0	0	1	9.4	4 28.6	(	0x0x0000	0x0x0000	0x0x0000	0x0x0000	1
8		11/02/2010 8:15	213	2.99	216	234	49,96	0	0	1	9.1	9 32	0	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
9		11/02/2010 8:30	240	2,92	260	234	49,97	0	0	1	10,4	4 33,3	0	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
10		11/02/2010 8:45	219	1,71	296	234	50,01	0,36	71	0,991	11,	1 34,3	18	0x0x0000	0x0x0000	0x0x0000	0x0x0000	1
11		11/02/2010 9:00	170	3,13	328	232	49,97	1,86	427	0,999	1	3 36	106	0x0x0000	0x0x0000	0x0x0000	0x0x0000	1
12		11/02/2010 9:15	140	7,2	330	233	49,94	4,04	943	1	16,	6 38	233	0x0x0000	0x0x0000	0x0x0000	0x0x0000	-
13		11/02/2010 9:30	145	6,98	329	233	49,97	4,05	944	1	19,:	2 40,5	233	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
14		11/02/2010 9:45	148	5,32	331	234	49,95	3,11	728	1	20,	1 42	180	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
15		11/02/2010 10:00	155	6,28	330	234	49,98	3,89	908	1	21,	5 43,1	225	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
16		11/02/2010 10:15	172	1,46	327	233	49,97	0,94	208	-0,994	20,5	9 43,9	52	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
17		11/02/2010 10:30	184	1,99	329	234	49,97	1,37	316	1	20,	6 43,8	78	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
18		11/02/2010 10:45	192	2,45	331	235	49,97	1,79	418	1	20,	8 43,9	103	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
19		11/02/2010 11:00	191	10,2	333	235	49,97	8,07	1899	1	24,	9 45,2	469	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
20		11/02/2010 11:15	183	4,06	330	234	49,97	3,08	722	1	25,	1 47,2	179	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
21		11/02/2010 11:30	185	2,74	331	236	49,97	2,03	475	1	24,	3 47,1	118	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
22		11/02/2010 11:45	192	4,09	333	236	49,96	3,27	773	1	23,4	4 46,4	191	0x0x0000	0x0x0000	0x0x0000	0x0x0000	
23		11/02/2010 12:00	195	10,87	338	238	49,98	8,83	2111	1	28,	3 47,8	522	0x0x0000	0x0x0000	0x0x0000	0x0x0000	v
14 4	▶ ▶ Hoja1	Hoja2 Hoja3	<b>@</b> /								1			10		~		
Listo	)													Œ		% 😑	•	



## 9 Graphs

To access the graphs menu, select the Graphs icon **Gráficos** once you have accessed the plant.



There are two types of graph menus: data graphs and energy graphs.

#### **Data Graphs**

Select the parameter to be displayed on the specific day selected on the calendar.



To zoom in on the graph, click and drag the time range for which more detail is required..



🔆 Ingecon® Sun Manager 1.4 ###: In	team Energy :###
File OnLine Reading Data Li	Image: Graphics         Full Screen         Page: Help         Ingeteam
E Kingeteam Energy	Image         de         2010         Parameters           Lun         mar         mic         jac         vis         sába dom           26         27         28         29         30         1         2           3         4         5         6         7         8         9           10         11         12         13         14         15         6           17         18         19         20         21         22         23           24         25         26         27         28         29         30           11         12         3         4         5         6         6           Hoy:         13/05/201U         U         E         Generate Graph         Primt
	Vdc (V) 300
	250
	200
	150
	100
	0
	10:45 15:45
State : Conectado	Last Communication : CRC 0K

Once in this time range, to zoom out, click on the circles which are over the vertical axis scroll bar, and to the left of the vertical axis.





## **10 Full Screen presentation**

To access the Full Screen menu, select the Full Screen icon, once you have accessed the Plant.



There will be a series of on-screen labels positioned over the background image displayed by default. The label dimensions can be changed if required.

<b>X</b> Ingeco	n® Sun Manager 1.4	###: Ingeteam Energy :	###			_ 🗆 🗙
File	OnLine Reading	Data List Graphics	Full Screen	Ingeteam		
	eteam Energy 1					
		Ing	eteam hea	adquartes		
		Ciuda	ANALOG INPUT 5 - a ANAL MOVE MEII M	OG INPUT 6 - JIEN OVE ME!!		
			TRA	Energy cost - Move me!	Energy	
			Power - Move mel	Annual not emitted CO2 - Move mel	Power	
			Total energy - Move met	saved Move mel	These as	
			Load image	Monetary unit value Show 0,4404	∍ / k₩h	
State :	Conectado	1	Last Communication :	CRC OK	An	

Select the load image button **Load image** to load a different background image from the following text box.



Select file									<u>? ×</u>
<u>B</u> uscar en	1				•	0	<b>d</b> E	•	
Documentos recientes Escritorio Mis documentos	ScreenIn	nage.bmp T	Tipo: Imagen Tamaño: O by	de mapa de t 'tes	bits				
Mi PC	<u>N</u> ombre: Tip <u>o</u> :	Screen	Image.bmp ws bitmap (*.t	omp,*.dib)				•	<u>A</u> brir Cancelar

Click on the display button **Show** for the full on-screen PC display of all the online data for the Ingecon currently selected:





## **11 FILE STRUCTURE.**

When the program is executed for the first time, a directory is created with the user folder entitled My Documents **"Mis Documentos"**. This directory is called **"Mis Documentos/Ingeteam/Ingecon Manager**". This folder initially contains two. Xml files:

• plantas.xml: containing information on the program language, routes and the names under which the plant data is stored.

When a plant is added to the plant tree, a folder is created in directory: **Mis Documentos/Ingeteam/Ingecon Manager**. This folder shall be named after the plant added. If the plant name is **Planta 1**, the the folder name shall be: **Mis Documentos/Ingeteam/Ingecon Manager/Planta1**.

File **planta.xml** is automatically created with the **Planta 1** folder, containing information on:

- Plant creation date.
- Total stored energy.
- The Ingecons at the plant.
- The configuration of communications with the plant.

When an Ingecon is added to the tree of a specific plant (take Plant 1 as an example), a folder is created in directory: **Mis Documentos/Ingeteam/Ingecon Manager/Planta1**. This folder shall be named after the Ingecon selected. In fact, the possibility of the user entering values other than from 1 to 255 has been disabled. For example, if the inverter were number 2, then the folder would be "**Mis Documentos/Ingeteam/Ingecon Manager/Planta1**.

The following file shall also be created with the Plant 1 Folder:

• **fullscreen.xml**: with information on the display menu background image save route, and also on the position of the data labels to be expanded on the full screen with the Plant Online Data option..

Other typical files are:

 Ingecon Manager.exe: This is the system execution file, and its route is: Archivos de programa/Ingecon Manager.



- *ISManager.ico*: This is the application icon, with the same route as **Ingecon** Manager.exe.
- 070531\_001.xml : Daily data file pertaining to the Ingecon 1 on 31st May 2007.
- **Today.xml**: If data for the present day have already been downloaded, then this file will not be completed until the day has ended. For this reason it is stored with this name instead of with the format used by the rest of downloaded data files. This serves to indicate that the downloaded data are not yet definitive.

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# Ingeteam

Ingeteam Energy, S.A.

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