

	onligure communication with the fu	el cell
Status Errors	EFOY Pro 2400 Duo	Serial number: 302305-1507-35207 Firmware: 17.13
Set Up	SERIAL SETTINGS	
Parameters	Comm Port COM3 Refresh Comm Port List	
Larhidge	ETHERNET SETTING	
Export / Import	Host Name 192168.10.10	
Data logging Reports	Port Number 2,167 Timeout (s) 5.0	
Terminal Updater	CONNECTION C G	mmunications log
MADE BY SEC	Connect (COM3)	
	Disconnect	

# SFC Connect Program to communicate with EFOY fuel cells



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### 2 Introduction

### 2.1 Preface

The "SFC Connect" software was developed to diagnose SFC Energy AG units.

It is a licenced product and must not be passed on to others without approval from SFC Energy AG.

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### 2.2 Service Contact

SFC Energy AG Eugen-Sänger-Ring 7 85649 Brunnthal-Nord Germany Hotline: (+49) (0) 89 / 673 592 555 Toll-free number\*: 00800 / 732 762 78 Email: <u>service@sfc.com</u> Web: <u>www.efoy-comfort.com</u> www.efoy-pro.com

\*This number is toll-free from landlines in the following countries: Germany, Belgium, Denmark, France, Great Britain, Italy, The Netherlands, Norway, Austria, Sweden, Switzerland and Spain.



### 3 Installation

#### 3.1 Installing the software

Open the "SFC Connect" program. When you open the software for the first time, you are prompted to enter your name and email address to request a licence code.

The program is protected and can only be used with a valid licence.

### 3.2 Requesting your licence

The following steps are required to request your licence:

- Enter your name and a valid email address. The specified name will be displayed on the service report which is created as the result of the diagnosis and which can be presented to the customer. Please therefore ensure the correct spelling of the name.
- 2. After the licence request has been checked, you will receive an email with a link. You will be requested to save a file.
- 3. Save the file.
- 4. Upload the file to SFC Connect.





#### 3.3 Communication - Connecting the unit

sec. SFC Sec	vice Tool			- <b>D</b> X
≪-	Communications	Configure communication w	vith the fuel cell	
Ċ	Status	No device conn	ected - connect to a device	
	Errors			
ŝ	SetUp	SERIAL SETTINGS	Ports 🔻	
	Parameters	Refresh Co	mm Port List	
	Cartridge	ETHERNET SETTINGS		
	Export / Import	Host Name 1	92.168.10.10	
K.A.M		Port Number	2,167 \$	
12AV	uara logging	limeout (s)	5.0 -	
	Reports	CONNECTION	Communications Log	
>	Terminal	Serial	•	
C	Uodater	Ethernet		
$\sim$	· · · · · · · · · · · · · · · · · · ·	Connect (No Ports)		
	MADE BY SEC	Disconnect		

#### 3.3.1 Connect the unit via serial communication

In order to connect the unit via serial communication, it first has to be connected to SFC Connect.



#### NOTE:

You will need the optional Interface Adapter IA 1 (item number: 151 075 011) for direct connection with a COM interface or an additional USB adapter (item number: 151 906 018) as well as a CAT5 network cable.

The unit must be connected to a battery.

#### 3.3.2 Connect the unit via Ethernet communication

With SFC Connect, a unit can also be diagnosed via an IP address. Remote access is required for this and a converter RS-232 to Ethernet must be used.

Please contact your SFC Partner if you would like to communicate with your unit via Ethernet.

Please be aware that not all functions may be available with the Ethernet connection.





#### 3.3.3 Update Firmware

During the connection process, the unit's Firmware version will be confirmed. All released Firmware versions are linked with the SFC Connect program. If the unit's Firmware is not up tp date, an update is recommended. If this is declined, it may not be possible to use all the features of the SFC Connect program. You can update it later within the software. Simply go to the Updater page. The Update is currently only possible with the serial/cable connection.

#### 3.3.4 Unit connected

When a connection has been successfully established, the unit type, serial number and Firmware will be displayed.

SFC Service Tool	
Communications	Configure communication with the fuel cell
U Status	Serial number: 302305-1507-35207
🔿 Errors	Firmware: 17.13
	SERIAL SETTINGS
. <o>&gt; Set Up</o>	Comm Port COM3
Parameters	Refresh Comm Port List
· · · · ·	
Carhidge	ETHERNET SETTINGS
Export / Import	Host Name 192.168.10.10
M <sup>-</sup> Data Innaian	Port Number 2,107 C
₩¥ Data ingging	Timeout (s) 3.0 v
Reports	CONNECTION   Communications Log
>_ Terminal	Serial
	Ethernet
Updater	Connect (COM3)
	Disconnect

Warning: To communicate with the SFC Connect program, the EFOY must be set to SIO/plain text.



### 4 Status: Operating State

The unit's current status is displayed on this page. You will receive information about current errors here.

This page is continuously updated.

sec SFC Service Tool		o x
Communications	View status information from the fuel cell	
└ Status	EFOY Pro 2400 Duo Serial number: 302305-1507-35207 Update Time: 08:	58:05
frors	Firmware: 17.13	
🚫 Set Up	STATUS INFORMATION	
Parameters	Operating Mode Operating State Battery Voltage Output Current Operation Time	
Cartridge	Automatic Off 12.97 V 0.0 A 3389.5 h	
Export / Import		
Data logging	AVERAGE DURATION OF CHARGING CYCLES	
Reports	Avg Cycl Auto Avg Cycl Manual Avg Cycl Remote	
>_ Terminal	0.0 h 0.0 h 0.0 h	
💭 Updater		
i Help	Warnings no warnings	
	Current Error no errors	
THERE'S TOR YOU MADE BY SEL		

### 5 Errors

The 10 most recent errors will be displayed as well as statistics about all errors. Please see the operating manual of the relevant unit for information about troubleshooting.



SFC Co	nnect												- 0 -×-
	Communications	Vie	w log	ged e	errors	from the	fuel cell						
Ċ	Status	FI	FO		ом	FORT	140	Ser	ial numbe	er: 281210-161	17-38348		
	Errors	-			•			Firr	nware: 15	.14			
_		ERI		ECOR	DS								
₹©}-	Set Up	Г	Index	Error Code	Value	Battery Voltage [V]	Output Current [A]	Stack Temp [°C]	Internal Temp [°C]	Heat Exchanger Temp [°C]	Internal Fluid Level [%]	Operating Time [h]	î
2	Darameters		21	184	0	13.2	0	41	28	31	95	538	
<u> </u>	Folometers		20	184	0	11.4	0	33	24	25	89	538	
	Fadridon		19	184	0	13.3	0	56	22	46	88	512	
	connuge		18	53	17000	0.6	0.1	56	22	47	87	512	
r < 5	Event / Image		17	184	0	13.2	0	25	22	23	91	512	
	exput / imput		16	184	0	13.2	0	22	22	22	93	512	
3Nr	Data Jagaiga		15	184	0	13.3	0	21	22	22	95	510	
<u>AV</u>	uara iuggirig		14	71	0	13.3	0	21	22	22	81	507	
	Pennits	-											*
	Repuis	ERI	ROR ST	TATIS	TICS								
۶.,	Terminal		Error	code	Count	Operating	Operating						î
~.			11		3	9.62	14.01	4					
S.	Updater		14	1		14.93	114.93						
			20	1	11	5.96	512.97						
(i)	Help		22	2	29	9.62	507.67						
			32		3	50.84	115,74						
			141	1		50.29	60.29						
CCA			50	,	753	59.53	507.67						
ENERGY PER			51	1		190.52	490.52						

### 6 Set Up: Control and set up the fuel cell

This page is used to control the unit and to set it up for further use.

Please see the operating manual of the relevant unit for further information.

se are se	rvice (oo)			
<b>~</b>	Communications	Control and set up the fuel cell		
Ċ	Status	EFOY Pro 2400 Duo	Serial number: 302305-1507-35207 Firmware: 17.13	Update Time: 08:59:20
(!)	Errors			
<u>نې</u>	Set Up	OPERATE	Set Up	
0		Operating mode	External Control Off	External Control On
	Parameters	Manual On	Fuel Gauge On	Fuel Gauge Off
	Cartridge	Manual Off		
ه^ ا	Export / Import	Automatic	Battery Protection On	Battery Protection Off
		Send Commands	Lang	juage Deutsch *
XX	Data logging	Remote On	SET CLOCK	
	Reports	Remote Off	Fuel Cell Clock	3/29/2018 2:30:30 AM
<u>&gt;</u>	Terminal	Hybrid command	Choose New Time	3/29/2018 2:27 AM
		Reset	Set Clearly to	2/20/2018 2-27/08 AM
$\mathbb{S}$	Updater		Jet clock to	572972010 2.27.00 AM
	Liele		Set	Clock to PC Time
	пер		Internal battery voltage is 2.57 V fuel cell is disconnected from th	V. The clock may not work correctly if the te battery
	MADE BY SEC			



### 6.1 Set clock

The fuel cell is equipped with an internal button battery for saving data without being connected to an external battery. Therefore, temperature during storage can be measured, for example.

This battery discharges and has a limited service life. This means that the time displayed by the fuel cell may be incorrect. If the unit is permanently connected to an external battery, the timestamp will work without an internal button battery.

Date and time can be set and/or changed using the SFC Connect program.

The SFC Connect program will notify the user of a discharged internal battery. Without a battery, a correct timestamp cannot be guaranteed.

### 7 Parameters: Battery parameters

On this page, all battery parameters can be set within the permitted values.

Please see the operating manual of the relevant unit for information about battery parameters.

The battery type and, if available, the voltage profile and communication protocol can be changed here.

MC. SFC Se	nvice Tool					_ <b>6</b> X
<b>~</b>	Communications	Configure the fuel cell				
Ċ	Status	EFOY Pro 240	0 Duo	Serial number: 302305	-1507-35207	Update Time: 08:59:50
	Errors					
<u>ين</u>	Set Up	Parameters Se	t all values to their	default value	Write Value	s to Device
	Parameters	Parameter	Value		12.30 V	
	Cartridge	<ul> <li>Switch on voltage</li> </ul>	11 4	1		▶ 13
ŝ	Export / Import	Switch off voltage	13.5 ৰ	1	14.30 V	▶ 14.7
₩¥	Data logging	Switch off current	2.00 A	•	<u>і                                    </u>	▶ 10
	Reports			11.2	0 A	
>	Terminal	Battery protection	10.5 ৰ		1	▶ 12
$\mathcal{O}$	Updater					1
G	Help	BATTERY TYPE		MODBUS SETTINGS		VOLTAGE PROFILE
		Current Battery Type AGM		Enable Modbus		
		Select Battery Type AGM	•	Modbus Address	33 🗘	
EFC	MADE BY SHL			Serial Setting	9600 8-E-1 *	





### NOTE:

The SFC Connect program cannot communicate with the device via Modbus. A Modbus setting cannot be undone via the SFC Connect program but has to be reset to SIO/plain text using the control panel.

### 8 Cartridge

Use this page to view information about the fuel cartridges used and to change settings.

The following settings can be changed (may vary depending on unit):

- Select cartridge type
- Deactivate/activate fuel connectors
- View cartridge level (0...100%)
- Reset cartridge level
- Activate DuoCartSwitch and change settings





### 9 Export / Import

On this page, a unit's personalised battery parameters can be saved and transferred to other units.

MC SFC Se	rvice Tool	
	Communications	Export or import fuel cell configurations
Ċ	Status	EFOY Pro 2400 Duo Setial number: 302305-1507-35207 Firmware: 17.13
	Errors	
<u>ې</u>	Set Up	EXPORT Export current configuration of connected fuel Cell
	Parameters	
	Cartridge	IMPORT Import Fuel Cell Configuration from Disk
ŝ	Export / Import	Write Values to Connected Fuel Cell
₩¥	Data logging	Parameter Value Write Success
	Reports	
>	Terminal	
$\mathcal{O}$	Updater	
í	Help	
	MADE BY SEC	

### 10 Data logging: Test run

You can start the unit's test run from this page.

We recommend a test run of 3.5 hours to obtain meaningful values. It should not be less than 1 hour so the test run can be evaluated. Ensure that, after the test has been completed, the unit has an internal status of 20 (black line). That means that the unit has reached the charging phase. Only then are the performance figures meaningful. You must also make sure that the EFOY is continuously charging during the test run of 3.5 hours and that it does not turn off because of a deactivating parameter.



#### NOTE:

The unit will not automatically turn on when the test run starts. It must either be turned on manually or the activating criteria must be reached in automatic mode.

Please see the following pages for information about evaluating the test run.



IFC SFC Connect	
Communications	Log data from a fuel cell
U Status	CONFIGURE DATA LOGGING EFOY COMFORT 140 Serial number: 281210-1617-38348 Firmware: 15.14
1 Errors	Test Duration 60 min * Start Test (60 min) Stop Test
🏠 Set Up	CURRENT DATA
Parameters	Data         Value         Units         Color         120           •         Cutput Power         0.00         W         Units         Units
Cartridge	Stack Temperature         62.19         °C         66           Internal Temperature         2722         °C         64
Export / Import	Heat Exchanger Temperature 52:51 'C Internal Fluid Level 89:56 %
Data logging	Internal State 0.00 n 11.5 13.00
Reports	Reservoir Temperature 27.22 C Voltage
	25 20 -
	E 15-
Liele	s-
	Elapsed Lime: 6000 (inmiss), 100.0 %, 34/8 records
	Current Error   Power
MADE BY SEC	73

### 10.1 Test parameters

The following parameters will always be displayed:

- Output Power [W]
- Temperature (at the stack, at the heat exchanger and the internal temperature) [°C]
- Internal Fluid Level (service fluid) [%]
- Battery Voltage at the unit and the battery [V]
- Internal State [value: 0...20]

Additional parameters are recorded. They can be saved in an Excel file for evaluation.

#### 10.1.1 Output Power

The output power is measured for the entire duration of the test.

Please see the relevant operating manual and the unit's technical documentation for target values.

#### 10.1.2 Temperature

The stack temperature should always be between 68° C and 75° C.

### SFC Connect





### NOTE:

If the stack temperature is too high, this is an indication of an insufficient air supply which can result in a loss of output power. Please check the methanol supply, the installation point (supply air and exhaust air) and the exhaust system.

The internal temperature should not exceed 36° C during operation. High temperatures can be indicators of incorrect installation.

#### 10.1.3 Internal Fluid Level

The fluid level in the intermediate tank must be above 85% at the end of the test run. If the fluid level is too low, the installation point or the unit must be checked for leaks.

#### 10.1.4 Battery Voltage at the unit and the battery

The battery voltage is measured directly at the unit and at the battery. A difference of between 0.1 and 0.2 V is permissible.

If the difference between the two values is too high, check the cables. Corroded or extended cables can result in a disproportionate loss of voltage.

#### 10.1.5 Internal State

A value between 0 and 20 indicates the current operating state.

0: The system is turned off

1-15: The system is in the starting phase and cannot yet output full power.

16-19: Charging has begun

20: Charging

During regular operation, the unit will reach the charging phase after about 10 to 20 minutes, i.e. the internal state of 20. If this is not reached in a test run lasting one hour, this indicates a malfunction.



### 10.1.6 Additional parameters

SFC Co	innect	- 8 X
≪-	Communications	Log data from a fuel cell
$\bigcirc$	Status	CONFIGURE DATA LOGGING EFOY COMFORT 140 Serial number: 281210-1617-38348 Firmware: 15.14
	Errors	Test Duration 60 min * Start Test (60 min) Stop Test
<u>کې</u>	Set Up	CURRENT DATA
	Parameters	Data         Value         Units         Color         1155         1300           •         Output Power         0.00         W         1155         1300
	Cartridge	Stack Temperature 6219 °C  Internal Temperature 2722 °C  True True True True True True True True
ŝ	Export / Import	Heat Eichanger Temperature 5251 'C 65 Internal Ruid Level 8936 % 57
<u>kx</u>	Data logging	Internal State 0.00 n Battery Voltage 1319 V 50 25 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10
	Reports	Reservoir Temperature 2722 C
»	Terminal	1155 1300
$\mathcal{O}$	Updater	600 ] [100
í	Нер	Elapsed Time: 60:00 (mm:ss), 100.0 %, 3478 records
EF¢	MADE BY SEC	0 errors 200 200 200 200 400 500 600 000 000 000 000 000 000 000 0

Over the

### 11 Reports

All data retrieved can be saved in a PDF report.

Results of a test run are only displayed after a minimum duration of an hour. This is required for meaningful values.



es. SFC Se	rvice Tool		- 0 ×
<b>~</b>	Communications	Generate and send reports	
Ċ	Status	EFOY Pro 2400 Duo Serial number: 302305-1507-35207	
	Errors	Filliware, 17:15	
<u>ين</u>	Set Up	Customer Test User Customer Company Test Company	
<u></u>	Parameters	Summary	
	Carhidge	Generate Report Stor Report Rive 2	
Ś	Export / Import	Оплетие перот. Заче перот. Кал эт с заррот. тне	
KX.	Data logging		Î
	Reports	SFC.	1
>	Terminal	EFOY Pro 2400 Duo - SN: 302305-1507-35207	
$\mathcal{O}$	Updater	Report Date: 4/12/2018	
i	Help	Created by: Kicarda Gauder	
		Customer Data Customer: Test User Company: Test Company Summary:	
EHC.	MADE BY SEL		

If requested by the SFC Customer Service Team, a "SFC Support file"(2) can be saved on this page and sent to SFC Customer Service at <u>service@sfc.com</u>.



### 12 Terminal

RF SFC Service Tool					
	Communications	Communicate directly with the fuel cell			
Ċ	Status	EFOY Pro 2400 Duo	per: 302305-1507-35207		
	Errors	Thinware.	( ) 20		
<u>ين</u>	Set Up	Clear Screen Copy to Clipboard			
	Parameters	sfc battery voltage 12.97V output current -0.82A memoritien time (chone and) 2280 5b			
	Cartridge	operation time (charge mode) 3389.5h operating state: auto off operating mode: auto			
ŝ	Export / Import	cumulative output energy 322947.9Wh no error cartridge level above sensor or no sensor (cartridge 1.1 consumed 0.0211)			
× X X	Data logging	no warning SFC>			
	Reports				
>	Terminal				
$\mathcal{O}$	Updater				
Í	Help				
	MADE BY SEC				

SFC Connect features a terminal function that allows communication with the unit via SFC commands.

Please contact your SFC Partner for further information about the terminal function.

### 13 Updater: Firmware update

Use this page to update the unit with the current Firmware. Uploading an older Firmware version is not possible.

SFC Service Tool				
	Communications	Update fuel cell		
Ċ	Status	EFOY Pro 2400 Duo	Serial number: 302305-1507-35207	
$\Lambda$	Errors		111111010.17.15	
- tij -	Set Up	Fuel cell is up to date		
	Parameters	Please make sure to regularly connect your computer to the internet and open the Service Tool to have always the newest Firmware varies externed astematicable for the service transmission of astematicable for the service service astematicable for the service transmission of the service transmission transmissi		
	Cartridge	version charges automatically		
	-	Update Fuel Cell		
r 🖘	Export / Import			
	Data logging			
2	Reports			



## 14 Help

- C					
≪ 1	Communications	Help and about			
Ċ.	Status	Sufframe Venior 1.00			
	Errors	Ralesce Date 4/4/2018 Firmware EFOY Pro 2460 Date 17.13			
(\$) :	Siet Up	Product Support			
	Parameters	User Manual EFOY COMFORT User Manual EFOY Fox 990/2400			
1	Cartridge	Verr Minnel EFOY Pro 12008 Date			
<u>6</u>	Export / Import	Central and Support			
12.	Data logging				
	Reports	Imprint and Disclaimer			
2.	Terminal				
$\mathcal{O}$	Updater	Imprint			
(	Help	Operator of the Service Tool			
EF¢)	Y VALE OF SEE	SCC/nergy AG Laper-Sarger-Bing 7 ISG41 Normathin-Ford Tel:+ 40 80 77 25 92 0			

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Eugen-Sänger-Ring 7						
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Germany						
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Web:	www.efoy-comfort.com					
	www.efoy-pro.com					

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