

Wiring & Configuration for Fronius Inverters

Fronius IG+ and CL Inverters can be attached to an Obvius AcquiSuite in order to communicate with DECK data servers. You will need a Fronius USB Converter, shown below:



The last Fronius COM card in your Fronius loop will connect to the Fronius USB Converter. This Converter then connects to the USB port on the Obvius 8810 or 8812 gateway. More detailed instructions follow.

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Supported Devices

Fronius: Fronius IG Plus or CL (not for use with Fronius IG)

Obvius: DAS that are compatible: AcquiSuite A8812-1 and A8812-GSM, AcquiSuite EMB A8810, and AcquiLite EMB A7810. To determine if a particular product is supported, or for access to custom modules, contact Obvius Sales.

012	Ok	Fronius Inverter 10	Fronius, IG Plus 12.0-3 WYE277, 3 phase inverter	2090	0	0	
051	Ok	Weather Station	Obvius, A8332-8F2D, IO Module, 8-Flex, 2-DO	6755	6755	0	80ms
250	Ok	Internal I/O	Obvius, A8812, Internal I/O	10589	10589	0	13ms
Add Troubleshoot Rename all devices				List all supported devices		Show: [none] [setup] [devinfo] [stats] XML	

Obvius Custom Module

Communicating with the Fronius USB Converter requires that the Obvius Data Acquisition Server (DAS) has a custom module. Contact Obvius Sales regarding access to that module.

Additionally, prior to installing the module, ensure that the DAS firmware version is **v02.11.714b** or later, such as release **v02.11.0814**, which is available on the Firmware Version page, and includes a kernel which must also be installed. Use the Firmware Version page to upgrade and verify the required versions.

Firmware Version ? ↻

Current firmware installed:

AcquiSuite Firmware version	v02.11.0814
usr apps version	v02.11.0814
root filesystem version	v02.11.0814
Linux kernel version	Linux 2.6.28.10-r1.89--g39f0aec

AcquiSuite Modules installed:

Vendor & Module Name:	Version:	Status:	Action (at next boot):
Obvius, LLC — Fronius Gateway for AcquiSuite ? <small>[Obvius_FroniusGateway.asmodule.cramfs]</small>	v1.11.0407_1b	Enabled, Loaded	<input type="text" value="Enable"/>

Note that a custom module cannot be downloaded from that page. Use the page to confirm the presence and version of the installed module, enable it, or view the module's ? status page.

Parts List

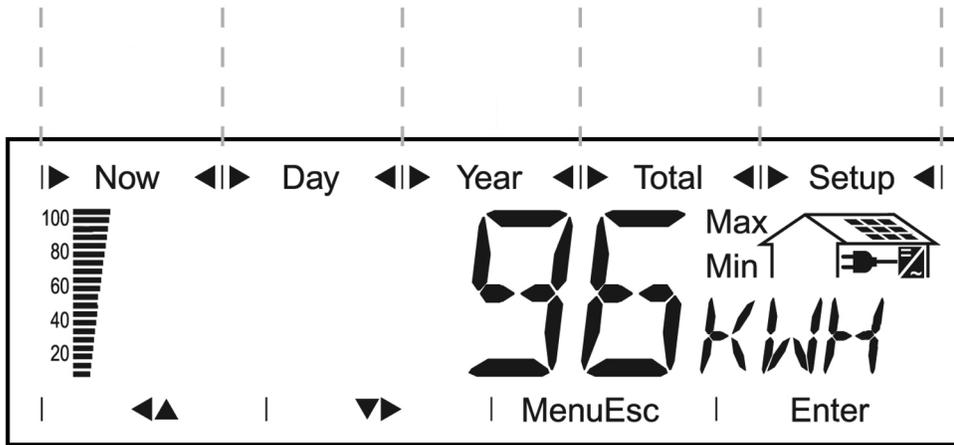


- 1 FRONIUS USB Converter (part number 4,240,119)
- 1 Fronius Com Card for each inverter
- Standard Cat-5 network cable wired straight through between each device. For multiple inverters in close proximity, consider buying prefab cables!
- Obvius Aquisuite (Models: A8812-1, A8812-GSM, A8810-0, A7810)
- Short USB extension cable (except A8810-0)
- Router with internet access and an open port

Wiring

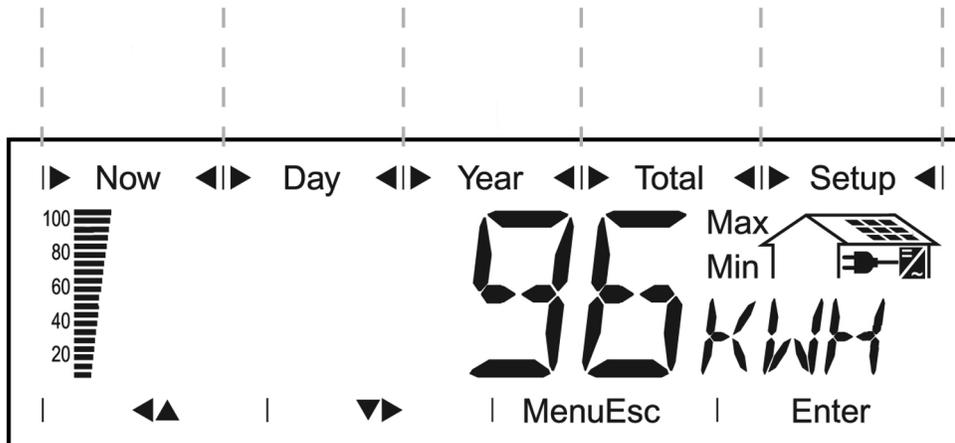
- 1 During planning stage, spec ½ conduit between inverters for cable if desired, NEMA rated enclosure for AquisSuite to suit location, AC power for Aquisuite and router.
- 2 Install Com Card in each inverter.
- 3 Install terminal plug into “in” port on Com Card farthest from AcquiSuite.
- 4 Daisy-chain remaining inverters with Cat-5 cable and RJ 45 plugs wired straight through from “out” to “in” on Com Cards. Be sure to test!
- 5 We highly recommend using prefabricates 3’ cables between inverters.
- 6 Plug cable into Fronius USB Converter. Cable can be up to 3,200 feet.
- 7 Plug Fronius Converter into USB port on AquisSuite EMB.
- 8 For AquisSuite A8812-1, open case and use a short USB extension cable to plug in converter, as it will extend past case.
- 9 Secure wiring.

Configure Inverter ID



- 1 After system is turned on, press "enter" and use right or left arrow keys (scroll) on the display to scroll to "setup" on far right and press "enter".
- 2 Scroll to "IG NR" and press enter.
- 3 Use up, down and enter buttons to enter an address unique to the inverter (*the same as a modbus ID*).
- 4 Be sure not to use the same address twice, and consider the layout of devices and how they will show up in the Obvius interface.
- 5 Escape and restart the inverter.

Configure Inverter Mode and Baud Rate



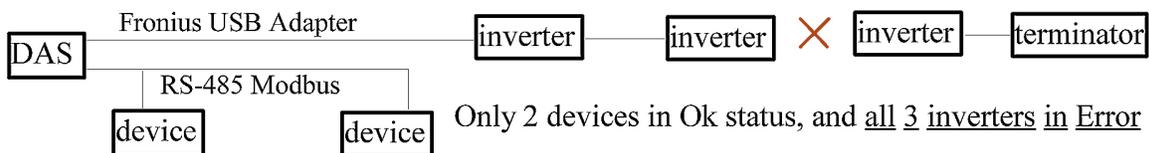
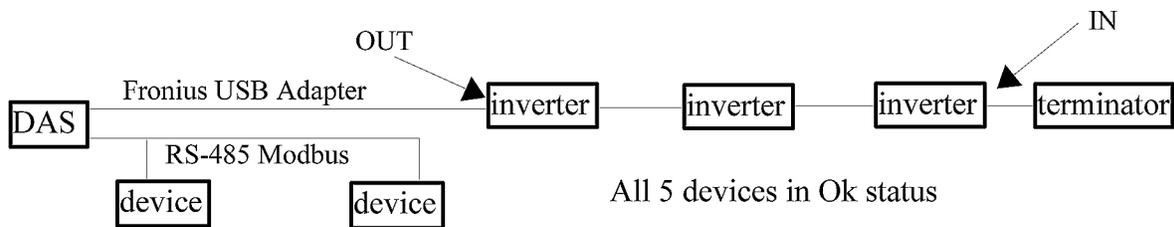
- 1 After system is turned on, press "enter" and use right or left arrow keys (scroll) on the display to scroll to "setup" on far right and press "enter."
- 2 Press the second button from the right 5 times until a 5 digit line of 0's appear (00000).
- 3 Scroll to "2," and hit enter. The cursor will move to the next position. Continue till you have "22742" and hit enter twice.
- 4 Scroll to "Comm" and hit enter.
- 5 Scroll to "mode" and hit enter.
- 6 Change to IFP and press enter.
- 7 Press escape until you get back to the start up mode.
- 8 Restart inverter for changes to take effect.

Modbus Devices and USB Communications

The Fronius inverters communicate across a USB serial connection, which is different from typical RS-485 Modbus wiring. With typical RS-485 daisy-chain wiring, when any one device is removed from the daisy-chain, the remaining devices continue to transmit and receive.



With the Fronius ring topology, each ring node receives and then re-transmits, so communication requires that all of the devices on the ring are connected, powered, and functioning. These simplified diagrams illustrate the different functionality.



Refer to Fronius documentation regarding the Fronius ring functionality, configuration and troubleshooting. If the ring is not functional, the configurations in the DAS cannot access the inverters. The inverter communications issues must be resolved before the DAS can read data from the inverters.

For example, the Fronius Com Card needs to be set for IFP, and each inverter needs a unique IG NR (consult Fronius for details); each inverter needs a unique IFP INV ID in the range 1-99, not zero "0." Be sure to correctly connect the terminator at the IN port, and to use reliable new cabling. Also be sure that all inverters share the same baud rate.

Currently the DAS only supports one USB port, dedicated to one function, such as the Fronius adapter. While communicating with the Fronius gateway, the DAS continues to communicate with traditional Modbus/TCP and Modbus RS-485 devices using the normal established methods.

To verify the USB process connectivity, view the USB Devices page, under System. Additionally note that the Fronius communications can be independently verified using the software supplied by Fronius.

USB and Serial Devices Currently Connected

Port	Device Name	Vendor	S/N	Vers.	Max Power	Vendor ID	Product ID
usb1	AcquiSuite root hub	Obvius	ep93xx	1.10	0mA	1d6b	0001
ttyUSB0 (in use by 479)	Fronius Converter USB	Fronius	A6TEZRPI	2.00	100mA	101e	000a
ttyS0	A8812 daughtercard						

OBVIUS
 3300 NW 211th Terrace, Hillsboro, OR 97124
 Ph: +1-503-601-2099 Fax: +1-503-601-6878
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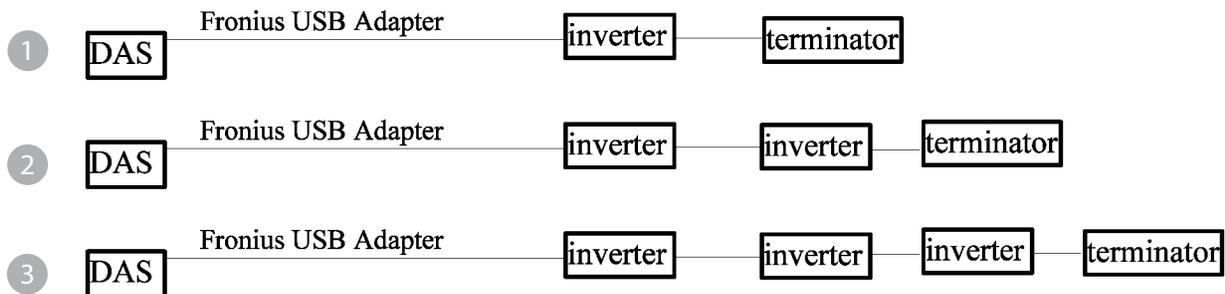
support@obvius.com

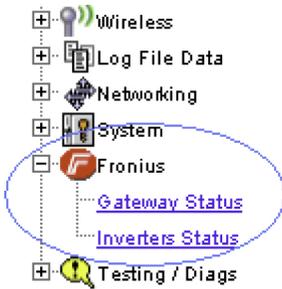
Current time: Monday, April 04 2011 21:10:57 UTC

Diagnostics

Device acquisition communications may take minutes. Factors such as the baud rate of the inverters has an effect on this, as detailed in the Fronius Gateway Help (every Fronius page on the DAS has a ? Help link).

One handy technique to check functionality is to sequentially build the ring as each inverter is found by the DAS, starting with only one inverter and the termination adapter. Once the Inverters Status page and Device List show the first inverter, add a second one, and so on, as shown in the following illustration.





The Gateway Status page includes many diagnostics indicators, such as uptime and a quick summary, as well as much finer details on the current conditions. Additionally, the page contains links to other much more detailed diagnostics, such as the Fronius Error Log and Fronius Debug Messages. The inverters produce many diagnostic messages all the time, which appear in these logs. Refer to the Fronius documentation for information on the significance and meanings of the messages, such as status numbers.

The status of the group of inverters can be viewed by clicking on the Inverters Status link. And as with any typical device logged by the DAS, each inverter can be viewed and configured from the Device List page under Modbus. This includes inverter-specific status, communications statistics, device information, and Advanced pages.

Fronius Inverters Status and Power Generation



Instantaneous Power Generation per Node (kW) — updated every ~5 seconds

#1-25	kW	#26-50	kW	#51-75	kW	#76-99	kW
Node 1:	--	Node 26:	--	Node 51:	--	Node 76:	--
Node 2:	7.757	Node 27:	--	Node 52:	--	Node 77:	--
Node 3:	7.710	Node 28:	--	Node 53:	--	Node 78:	--

Note: Expected Error Conditions

Inverters drawing power from solar arrays will go into error conditions overnight unless they have supplemental power sources when the arrays cease generating any power. These expected error conditions will appear in log files, messages and pages listing inverter conditions.

Fronius Gateway Status



Gateway status:



OK

Gateway uptime: 4 days, 11 hrs, 44 min, 42 sec
 Gateway version: v1.11.0330_5b
 USB serial adapter: Fronius Converter USB, vers= 2.00, S/N=A6TEZRPI, VID=101e, PID=000a
 Fronius baud rate: 9600 bps [Force Probe of Fronius Ring](#)
 Fronius nodes: 10 inverters detected, 400 total data points
 Pipelining: Enabled
 Fronius Queries "in flight": 0 out of 111 max
 Fronius Query response time: 212 +/-28 mS
 Fronius Bytes sent/sec: 1 bytes/sec
 Shortest recommended Data Logging Period: 0 min, 20 sec or greater ([change Logging Period](#))
 Modbus/TCP status: 10 active connections
 Modbus/TCP port: 503
 Gateway accessible from: Allow Modbus TCP access from local subnet only ([change Modbus/TCP access](#))

	Total	Last Minute
Frames transmitted:	1007355	--
Frames received, OK:	1008783	--
Frames received, Bad:	4	0
Protocol errors:	0	0
Data query timeouts:	719	0
Data points spoilt:	0	0
Internal errors:	0	--

[View Fronius Error Log](#)

Fronius debug information:
 Pipelining mode: