



Delta Direct Attach – Domestic Installation

Inverter summary

Inverter Manufacturer	Delta
Inverter Model	All models
Inverter Size	All sizes
RS485 Interface	Included with all models
Maximum number of inverters connected to a single SPLASH Monitoring STREAMbox	62

List of parts required for connection of inverter to SPLASH Monitoring

To enable you to connect the above inverter to SPLASH Monitoring you will need a SPLASH Monitoring STREAMbox and connection cables, these parts are listed below:

Part description	Part number
Inverter Make / Model	As above
SPLASH Monitoring STREAMbox	SBoxS2 - Hardwired network and inverter connections
Connection cable STREAMbox to inverter	Part numbers SM FTDI RS485-USB 3m
Connection cable STREAMbox to clients router or LAN	Part numbers SM CAT5 1m – 1m CAT5 cable SM CAT5 2m – 2m CAT5 cable SM CAT5 5m – 5m CAT5 cable SM CAT5 10m – 10m CAT5 cable
USB Serial Adapter	USB to RS485 pig-tails Adapter

Installation Guidelines

To ensure long term reliable monitoring;

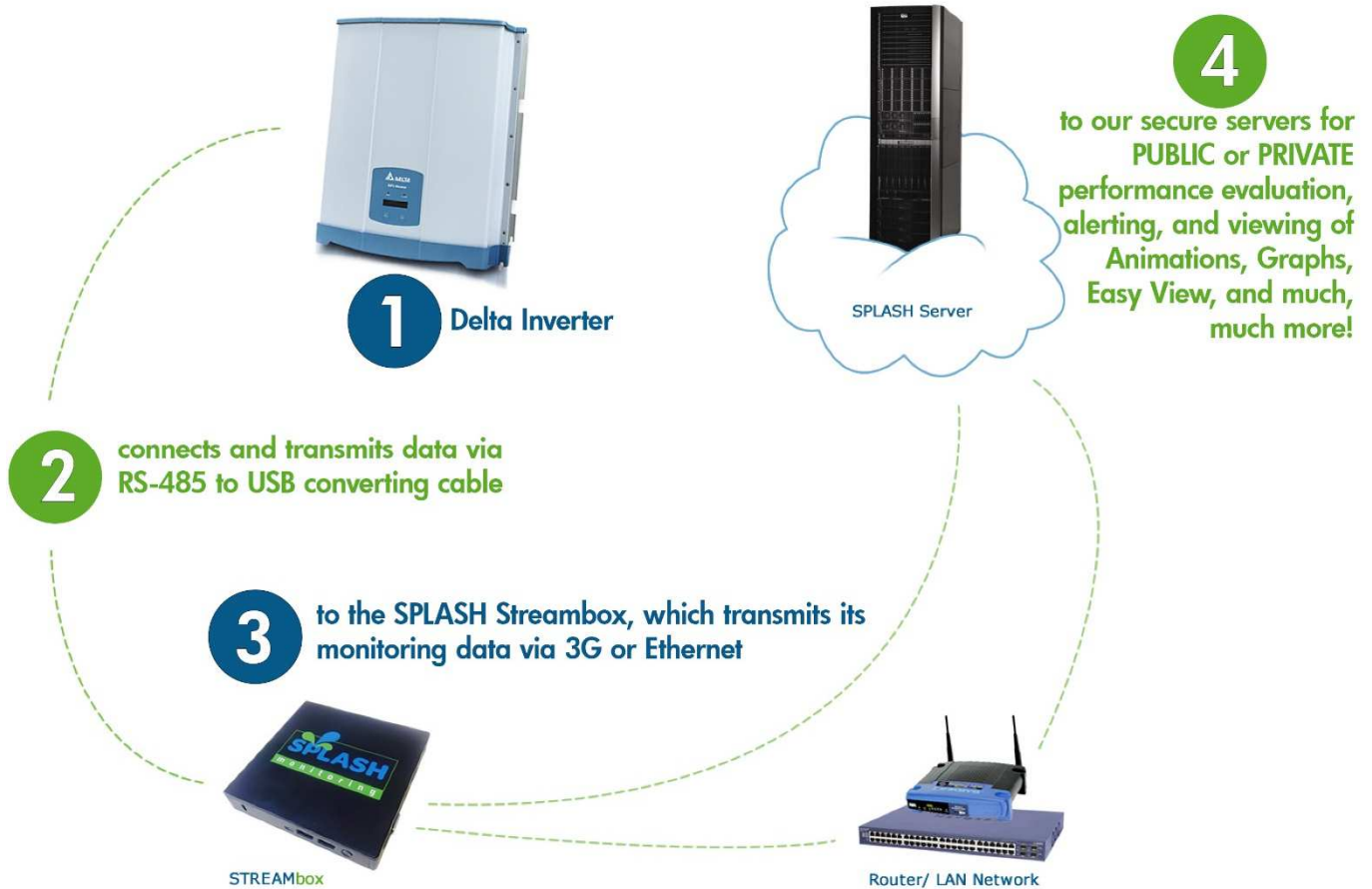
1. Install the Streambox and its power supply away from daily operational areas where the hardware could be accidentally turned off such as someone's desk or work bench.
2. Locate or secure the equipment to prevent it from falling, slipping and becoming disconnected
3. Secure the power cord to the STREAMbox using the supplied "P" cable clamp (see below)
4. Ensure the Ethernet CAT 5 / 6 cables are in good condition with their retaining clips intact and make sure they are securely fitted to the equipment by giving them a gentle tug.
5. Secure cables to protect them from accidental snagging
6. Do not stretch cables to the point where any movement could cause them to become disconnected.
7. The equipment and power supplies will be labelled 'DO NOT SWITCH OFF', but you should inform people with access to the installation area that this equipment should not be turned off; for example cleaning and maintenance personnel



Setting Up Your STREAMbox and Delta Inverters

This section is intended as a quick guide to setting up Splash Monitoring and assumes your inverter is already connected to the PV panels and grid/batteries, and where necessary programmed according to your requirements. For more details please refer to the Inverter User Manual.

Basic Connectivity



The diagram above shows the connectivity between the various devices. The connections are:

- 1 – RS485 data bus between the inverter(s) and the STREAMbox.
- 2 – CAT5 or CAT6 LAN cable between the STREAMbox and your Network Access Device

Network Access Device: This may be a Router, ADSL Modem, Switch or other network device connected to the Internet.

The USB adapter can be located in any of the USB sockets on the STREAMbox. The adapter tails connect to the push-down terminal block on the first inverter. Depending on the inverter model and age then you may need an RJ45 plug to connect to the inverter. Please see the inverter manual for details on how to connect inverters together if there is more than one.

IMPORTANT NOTE: If your inverter has a communications board with a RJ45 socket, this RJ45 socket may or may not be an RS485 connection. Some inverters have both an RJ45 socket and a push-down terminal block, always use the push-down block. Some older inverters have only an RJ45 socket for RS485 communications, in this case please consult the Installation Guide very carefully because there are two types of RJ45 connector, the other type is for Digital Input & Emergency Power Off Functions and must not be connected to the STREAMbox.

Please take care when connecting the inverter(s) to the STREAMbox, if the distances are long then twisted pair cable must be used and the pairing is critical. Also the termination at the end of the bus can be critical, however, in practice we have found that on short cable runs in particular, the terminator is not critical, and sometimes impedes the signal. You may have to try both options to get it to work. Please refer to the Inverter User Manual for details.

Setting Up Your STREAMbox

Unless the STREAMbox has already been configured according to your specifications, it will be configured to acquire a DHCP IP address from your router or DHCP server. For most domestic applications this will work without any modification.

However, if you do need to change its settings see below or this link to the static IP address setup instructions <http://www.splashmonitoring.com/assets/IP-Requirements-for-STREAMbox-v1.7.pdf> for guidance.

Setting Up Your Inverters

Please refer to the inverter manual for instructions on how to change the settings.

Each inverter must be assigned a unique address starting from 1. The second and subsequent inverter addresses must be consecutive, with no gaps. I.e 1, 2, 3, 4 – NOT 1, 2, 5, 7. In the latter case, data will not be obtained from inverters 5 and 7.

Trouble Shooting:

- “No Stream Found” on the SM Web site. This is because the web site hasn’t received any data from the STREAMbox.
- Delta inverters will not respond if there is no DC power from the PV panels, so setting up your STREAMbox for the first time at night will not work.
- Allow at least 10 minutes after powering up the STREAMbox before starting your diagnostic checks.
- Check the connections between the STREAMbox and your router and ensure you have a solid green light at the top right of the RJ45 LAN socket and a flashing green light at the top left of the socket.
- No solid green light could indicate: the STREAMbox is switched off, check the power lights on the front of the STREAMbox, both top and bottom LEDs should be illuminated.
- Check the router is powered up; the LAN cable is connected to the router; the LAN cable isn't faulty. To eliminate the LAN cable and router, connect the LAN cable to a known working device like your laptop or PC and if you can get a web session, then the LAN connectivity is OK.
- Check the connection between the STREAMbox and the inverter, making sure the tails on the cable are connected to the correct terminals on the inverter. If you are using a cable supplied by SPLASH Monitoring, the pin configuration is:

SPLASH Monitoring Twin adapter USB Adapter	Delta Inverter
Green	signal D-
White	signal D+
Orange	signal gnd

USB to RS485 pig-tails USB Adapter	Delta Inverter
Yellow	signal D-
Red	signal D+
Black	signal gnd

NOTE: please cut off and remove the remaining cores, some carry voltages that will destroy the Inverter's comms card.

- Try power cycling the STREAMbox – switch it off, wait 5 sec, switch it back on.
- Try logging on to the STREAMbox: enter “splash” in your web browser’s address line, or if your STREAMbox has a fixed IP address, enter that into your web browser. For instructions on how to use the STREAMbox’s ‘Web Information Page’ go to <http://www.splashmonitoring.com/assets/SM-STREAMbox-Web-Information-Page.html>
- The most common issue we encounter is the site’s network firewall not allowing outbound traffic. This is rarely an issue with domestic routers, but common in managed commercial networks. Unless you have someone you can ask (like a network administrator) a good way to detect this issue is to log onto the STREAMbox and run a ‘Healthcheck’ report. This will give you lots of information including whether the STREAMbox can ‘see’ the internet.
- If you have a proxy server you will need to make special arrangements with your network administrator to have the STREAMbox circumnavigate it by issuing a fixed IP address with appropriate privileges.
- Generally there must only be one ‘master’ device on an RS422/RS485 bus. The STREAMbox is a master device and as such can be the only one attached to your inverters, so make sure you don’t have another data logging device attached to the RS422/RS485 bus. It will very likely work intermittently, but the data flow will be unreliable and possibly corrupt if there are multiple master devices attached.

Model Numbers:

The STREAMbox transmits the model numbers so that the number before the decimal point represents the Delta model type, followed by the numerical model variant after the decimal point . The numerical code is derived from the following table:

INVERTER TYPE	Description Country Text(for old display)
0	Production 50Hz PROD 50Hz
1	US version US
2	EU version (old VDE0126 etc.) EU
3	Spain 51/49Hz ES
4	Italy 50.3/49.7Hz IT
5	Greece continent GR
6	DE German version (new VDE0126) DE VDE
7	Portugal PT
8	Czech republic CZ
9	Taiwan TW
10	Belgium BE
11	French FR
12	Spain 51/48Hz ES
13	Italy 51/49Hz IT BT
14	Greece island GR
15	US 208V DELTA US
16	US 208V DELTA, 120 W YE US
17	US 240V DELTA US
18	US 240V DELTA, 120 stinger US
19	US 240V DELTA, 120 split US
20	Korea 60Hz KR
21	Australia 50Hz, New Zealand AU/NZ
22	French Island 50Hz FR
23	French Island 60Hz FR
24	Production 60Hz PROD 60Hz
25	Thailand PEA TH PEA
26	China CN
27	India IN
28	DE MVD DE MVD
29	DE LVD DE LVD
30	United Kingdom UK_G83
31	United Kingdom UK_G59
32	Netherlands NL
33	Slovakia SK
34	Australia 50Hz Power Limited AU L 2.49 (+ AU PL 4.99)
35	Italy 51.5/47.5Hz IT MT
36	Belgium BE 2
37	SLN SI SODO
38	DK LVD DK LVD
39	SPAIN Island SPAIN Island
40	BE C10/11 12 BE C10/11 12
41	IT BT CEI 21 (<.6kW) IT BT 21
42	IT MT A70 IT MT A70
43	Romania RO
44	Bulgaria BG
45	IT BT CEI 21 (>6kW) IT BT 21>6kW
46	Australia 50Hz Power Limited 4.6 AU PL 4.60
47	Australia 50Hz Power Limited 2.99 AU PL 2.99
48	United Kingdom UK G59 -2 240
49	Poland PL
50	France VFR 2013 FR VFR 2013
51	France VFR 2014 FR VFR 2014
52	United Kingdom UK G83-2

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Var	Model	Cat	Var	Model	Cat	Var	Model	Cat
0	Not used		50	SOL5.0-2TL1-S4		99	SOLIVIA CS	4
1	2500 W output power	0	51	SOL4.0-2TL3-S4		100	SOLIVIA CM	4
2	1800 W output power		52	Reserved		101	Reserved	
3	3300 W output power	1	53	SOL5.0-2TL3-S4	6	102	SOLIVIA 2.0 EU G4TR	6
4	5000 W output power	2	54	Reserved		103	SOLIVIA 2.5 EU G4TR	6
5	1300 W output power		55	SOLIVIA 2.5 AP G3	5	104	Reserved	
6	1670 W output power		56	Reserved	5	105	SOLIVIA 3.0 EU G4TR	6
7	1900 W output power		57	Reserved	5	106	SOLIVIA 3.3 EU G4TR	6
8	2200 W output power		58	SOLIVIA 3.0 AP G3	5	107	SOLIVIA 3.6 EU G4TR	6
9	SOLIVIA 2.0 EU G3		59	SOLIVIA 3.3 AP G3	5	108	Reserved	
11	11kW 3 phases module		60	SOLIVIA 3.6 AP G3	5	109	SOLIVIA 4.4 EU G4TR	6
12	Reserved		61	Reserved		110	SOLIVIA 5.0 EU G4TR	6
13	Reserved		62	Reserved		111	SOLIVIA 10 EU G4TR EVR	6
14	SOLIVIA 5.0 EU G3	2	63	SOLIVIA 5.0 AP G3	2	112	SOLIVIA 11 EU G4TR R	
15	SOLIVIA 2.5 EU G3	5	64	Reserved		113	SOLIVIA 11 EU G4TR	6
16	Reserved	5	65	Reserved		114	SOLIVIA11 EU G4TR	6
17	Reserved	5	66	SOLIVIA 0.25 US		115	Sol7.0-1TR3-E4	
18	SOLIVIA 3.0 EU G3	5	67	Reserved		116	Sol9.0-1TR3-E4	
19	SOLIVIA 3.3 EU G3	5	68	Reserved		117	Reserved	
20	SOLIVIA 3.6 EU G3	5	69	Reserved		118	Reserved	
21	Reserved	5	70	SOL6.0-2TL3-S4		119	Reserved	
22	Reserved	5	71	SOLIVIA8.0EUG4TL		120	SOLIVIA3.0 NAG4TL	6
23	Reserved	5	72	Reserved		121	SOLIVIA3.8 NAG4TL	6
24	Reserved		73	SOLIVIA12EUG4TL	6	122	SOLIVIA5.0 NAG4TL	6
25	Reserved		74	Reserved		123	SOLIVIA7.6 NAG4TL	6
26	Reserved		75	Reserved		124	SOLIVIA5.2 NAG4TL	6
27	SOLIVIA 15 EU TL	3	76	SOLIVIA18EUG4TL		125	SOLIVIA6.6 NAG4TL	6
28	SOLIVIA 20 EU TL	3	77	Reserved		126	Reserved for HDC	
29	Reserved		78	Reserved		127	Reserved for HDC	
30	Reserved		79	SOLIVIA24EUG4TL		129	Reserved for HDC	
31	SOLIVIA 2.5 NA G4	5	80	Reserved		130	Reserved	
32	Reserved	5	81	Reserved		131	Reserved	
32	Reserved	5	82	SOLIVIA30EUG4TL		132	Reserved	
34	SOLIVIA 3.0 NA G4	5	83	Reserved		200	RPI M6	3
35	SOLIVIA 3.3 NA G4	5	84	Reserved		201	RPI M8	3
36	SOLIVIA 3.6 NA G4	5	85	SOLIVIA3.0EUT4TL	7	202	RPI M10	3
37	Reserved	5	86	Reserved		203	RPI M12	3
38	SOLIVIA 4.4 NA G4	5	87	Reserved		204	RPI M15A	3
39	SOLIVIA 5.0 NA G4	5	88	SOLIVIA5.0EUT4TL	7	205	RPI M20A	3
40	Reserved		89	SOLIVIA6.0EUT4TL	3	206	RPI M30	3
41	Reserved		90	SOLIVIA8.0EUT4TL	3	207	RPI H3	7
42	Reserved		91	SOLIVIA10EUT4TL	3	208	RPI H5	7
43	SOLIVIA 15 EU TL G4	3	92	Reserved		209	RPI H3A	7
44	SOLIVIA 20 EU TL G4	3	93	SOLIVIA12EUT4TL	3	210	RPI H4A	7
45	Reserved		94	Reserved		211	RPI H5A	7
46	Reserved		95	SOLIVIA30EUT4TL	3	212	RPI H3A (for DES)	8
47	Reserved		96	Reserved		213	RPI H4A (for DES)	8
48	Reserved		97	Reserved		214	RPI H5A (for DES)	8
49	SOL4.6-2TL1-S4		98	Reserved		215	RPI M6A (for DES)	
215		8						
216	RPI M8A (for DES)	8						

217	RPI M10A (for DES)	8					
218	PRI M50A (for DES)	8					
219	RPI M30A	8					
250	SOL0.26-1TR1-N4P						
251	RESERVED μ INVERTER						
252							
253							
254							
255							

- Category 0: SI2500 (INVERTER_VARIANT 1 and INVERTER_TYPE not 2)
- Category 1 SI3300 (INVERTER_VARIANT 3 and sw version equal or greater to 8.0)
- Category 2 SI5000 (INVERTER_VARIANT 4, 14, 63)
- Category 3 SOLIVIA 6 / 8 / 10 / 12 / 15 / 20 / 30 TL + RPI (INVERTER_VARIANT 27, 28, 43, 44, 89, 90, 91, 93, 95, 200-206)
- Category 4 Solivia CM/CS (INVERTER_VARIANT 100 or 99)
- Category 5 SOLIVIA EU/US/AP (INVERTER_VARIANT 15-23; 31-39; 55-60)
- Category 6 Solivia EU G4 / NA G4 (INVERTER_VARIANT 53, 73, 102, 103, 105, 106, 107, 109, 110 111, 113, 114, 120, 121, 122, 123, 124, 125)
- Category 7 SOLIVIA 3.0 / 5.0 T4 TL + RPI (INVERTER_VARIANT 85, 88, 207 -211)
- Category 8 RPI H3A / H4A / H5A / M6A / M8A / M10A / M30A / M50A (INVERTER_VARIANT 212 -219)

For example a SOLIVIA 5.0 AP G3 for Australia/NZ would show up as “21.63” the “21” representing the type and the “63” the variant, as depicted in the above tables.

Status Codes:

There are many variants and meanings of the various status codes, please see separate Delta document “Delta Status” explaining these. However, in general the status codes will be zero if the inverter is in a normal condition.

If you see “-1” in the Global Status this means the inverter did not respond. Bear in mind Delta inverters stop responding when there is no DC input, ie. when there is little or no sunlight. Under these circumstances any previously gathered cumulative data will show up, such as Energy Lifetime, but instantaneous values will be missing, such as PV Power etc.