



# SMA Direct Attach – Domestic Installation

## Inverter summary

Inverter Manufacturer	SMA
Inverter Model	All the Sunny Boy range and the smaller Sunny Central range
Inverter Size	From 1700W to around 5000W
Maximum number of inverters connected to a single SPLASH Monitoring STREAMbox	64

## 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	SMSB HW - Hardwired network and inverter connections
Connection cable STREAMbox to inverter	Part numbers SMA D9F-tails 3m SMA D9F-tails 10m
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
Optional	USB to RS485 D9F Adapter

## Installation Guidelines

We have found that the most reliable long-term results are achieved when the Streambox, DL2 and their respective power supplies are installed well away from daily operational areas. The problem is that the loss of the Splash Monitoring service is not immediately obvious, so it can be many days or weeks before someone realises that their system is not being updated. We are in the process of developing a mechanism to detect the loss of communication which optionally sends an email alert to one or more nominated recipients, but it is always prudent to minimise the risk of disruption by following these guidelines:

- If possible install the equipment and power supplies well away from daily operational areas such as someone's desk or work bench.
- Try and secure the equipment by attaching it to a wall or shelf with screws, Velcro or double sided tape. This should prevent it from slipping and becoming disconnected.
- Always secure the STREAMbox power cord to the STREAMbox using the P clip supplied. The P clip should be located on the back of the STREAMbox using one of the existing jack posts, as illustrated:

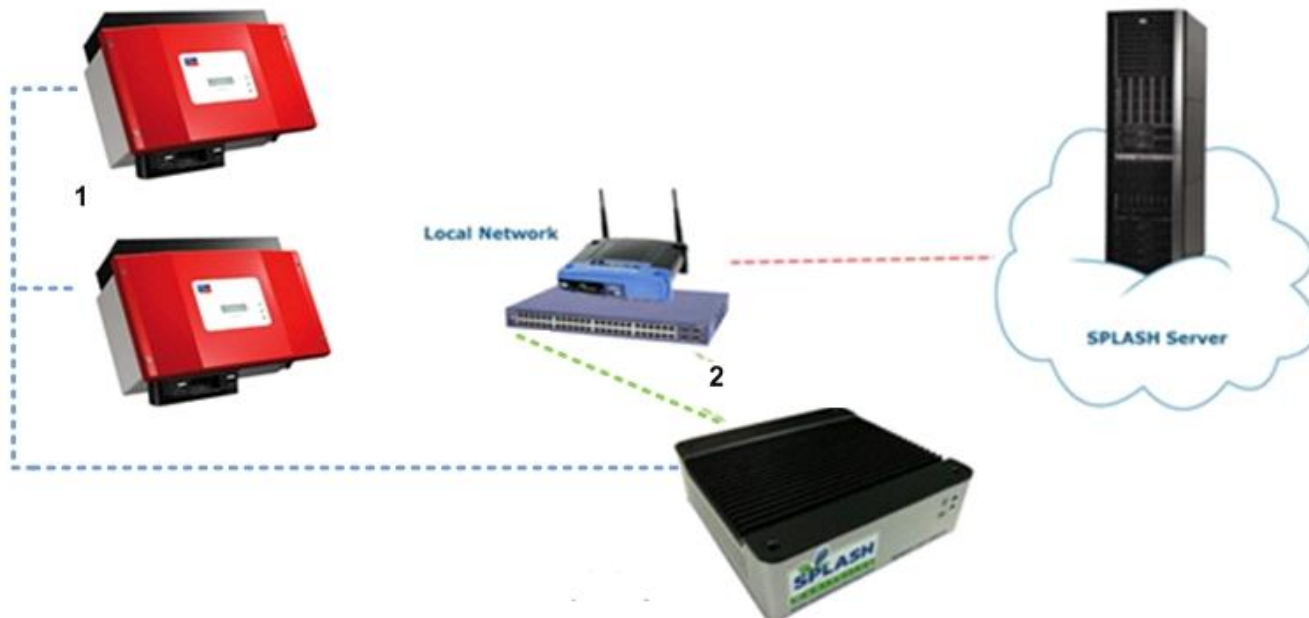


- Always ensure the LAN cables you use are in sound condition with their retaining clips intact, and make sure they are securely fitted to the equipment by giving them a gentle tug.
- Always ensure that all cables are secured using cable ties to protect them from accidental snagging.
- Never stretch cables to the point where any movement could cause them to become dislodged.
- Always install the STREAMbox with the ridged heat sink outwards and the side vents unobstructed. It doesn't matter what orientation is used; horizontally on its bottom (the flat black surface); or vertically on its side.
- 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 Sunny Boy 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 Sunny Boy 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.

Please take care when connecting the inverter(s) to the STREAMbox, if the distances are long then the twisted pairs are critical, D+ and D- (terminals 2 and 7 on the inverter) must be connected to the same twisted pair whilst GND (terminal 5) must be connected to a different pair. Also the terminating jumper on 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 for guidance.

### Trouble Shooting:

“No Stream Found” on the SM Web site:

This is because the web site hasn't received any data from the STREAMbox.

- SMA inverters can't be interrogated for data if there is insufficient DC power from the PV panels, so setting up your STREAMbox for the first time at night is not going to 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 left of the RJ45 socket and a flashing green light at the top right of the socket.
- No solid green light could indicate: the STREAMbox is switched off (check the power light on the front of the STREAMbox); or the router isn't powered up, or the LAN cable isn't connected to the router; or the LAN cable is

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 not using a cable supplied by SPLASH Monitoring, the pin configuration is:

STREAMbox COM1	SMA Inverter
D9 1 -----Green-----	terminal 7 (signal D-)
Female 2 -----Green/White-----	terminal 2 (signal D+)
5 -----Orange-----	terminal 5 (signal gnd)

CAT5 or equivalent UTP cable

- 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 very 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.
- The STREAMbox is not able to work with a proxy server. 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.

## Trouble Shooting:

“No Stream Found” on the SM Web site:

This is because the web site hasn't received any data from the STREAMbox.

- SMA inverters can't be interrogated for data if there is no DC power from the PV panels, so setting up your STREAMbox for the first time at night is not going to 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 left of the RJ45 socket and a flashing green light at the top right of the socket.
- No solid green light could indicate: the STREAMbox is switched off (check the power light on the front of the STREAMbox); or the router isn't powered up, or the LAN cable isn't connected to the router; or the LAN cable is 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. There's not much you can do other than check the physical connections at the STREAMbox, USB converter and the inverter.
- 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 very 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.
- The STREAMbox is not able to work with a proxy server. 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.