Equipment Note

Tesvolt with SMA STPS-60

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Contents

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1 Background

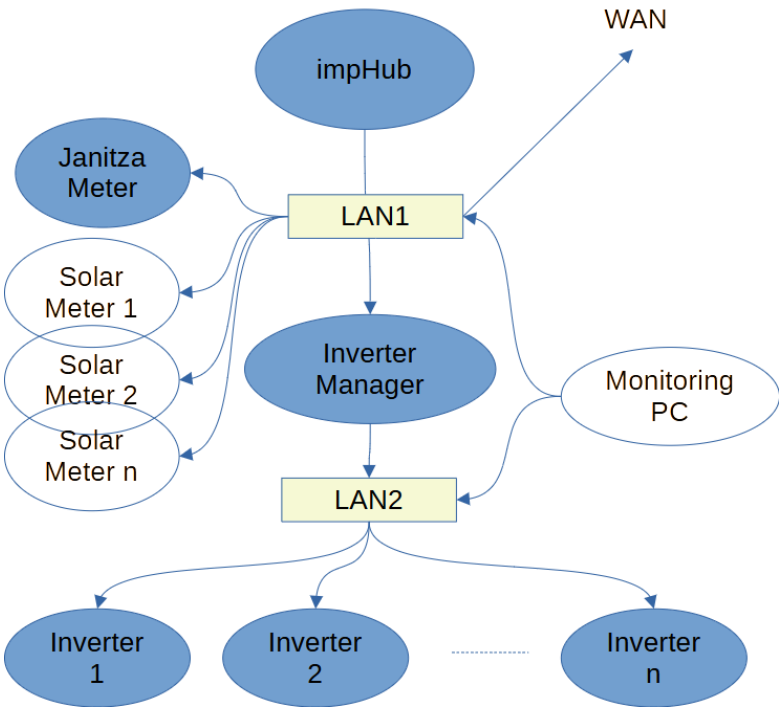
This equipment note describes how to use an impHub to control and monitor Tesvolt battery systems include the TSHV70 A-Series or TSHV70 E-series using the SMA STPS60.

Setup and commission your Tesvolt system according to the Tesvolt manual, following all electrical guidance from the Tesvolt manual. This guide only describes how to connect the impHub to properly commissioned TSHV70.

2 Networking

For the Tesvolt TSHV70 system the impHub talks to the Inverter Manager device, which is turn talks to the individual inverters. The system uses two individual networks, LAN2 for the battery devices and LAN1 for the monitoring components. The impHub needs to be connected to LAN1 and the firewall configured to allow internet access for the impHub. The Inverter Manager needs to be connected to both LAN1 and LAN2, take a note of the fixed IP address for the Inverter Manager on LAN1, you will need that later.

We recommend installing a monitoring PC with two ethernet ports connected to both LAN1 and LAN2. On this PC install Tesvolt BatMon, the SMA LCS Tool and TeamViewer. This then allows remote access to the monitor the battery and get support from Tesvolt.

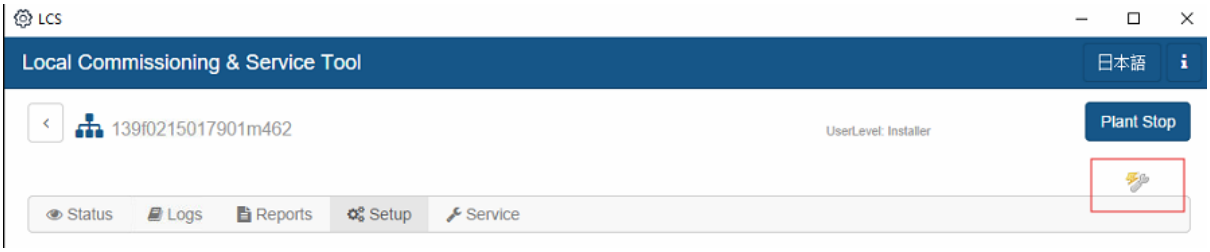


For LAN2 to the Inverter Manager assigns IP addresses using DHCP. For LAN1 the devices should be on fixed IPs, either statically assigned or DHCP reserved. In advance of the install, you will need to request IPs for the following devices:

- impHub
- Inverter Manager
- Janitza
- Any Solar Meters or Pulse Counters

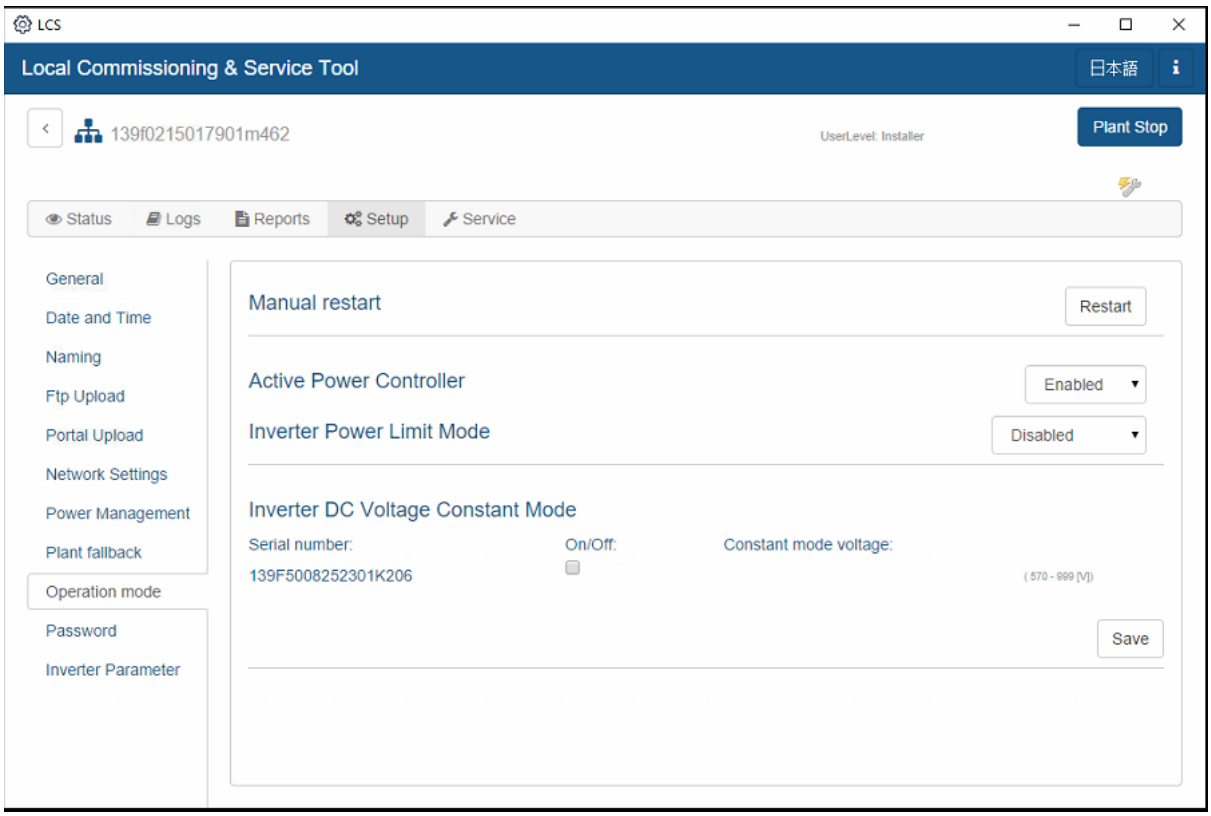
3 Configuring the Inverter Manager

To allow control from the impHub you need to make some configuration settings for the Inverter Manager, using the SMA LCS software. Goto “Service/Gridguard” and enter your Gridguard code, if you don’t have a Gridguard code apply to SMA for one. After entering the Gridguard code a little spanner symbol appears at the top right of the screen.



Navigate to “Setup/Operation Mode”.

- Active Power Controller: Enabled
- Inverter Power Limit Mode: Disabled



4 Solar Metering

If there is generation, such as solar, installed on site then this needs to be metered, so that the impHub has a complete picture of the onsite generation. Each generation circuit needs to be metered. Where there are existing generation meters installed, often a pulse counter can be added to gather this data. Alternatively, additional meters such as the Accuenergy Acuvim-II can be added to gather this data. For more details on adding metering, refer to our document "Gridimp Metering Options".

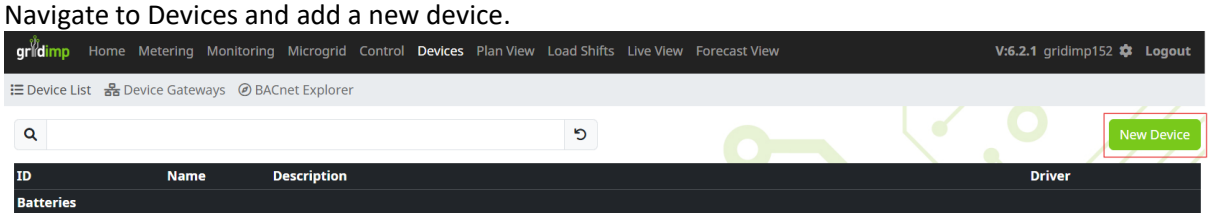
5 Configuring the impHub

For the impHub you will need to add the following devices:

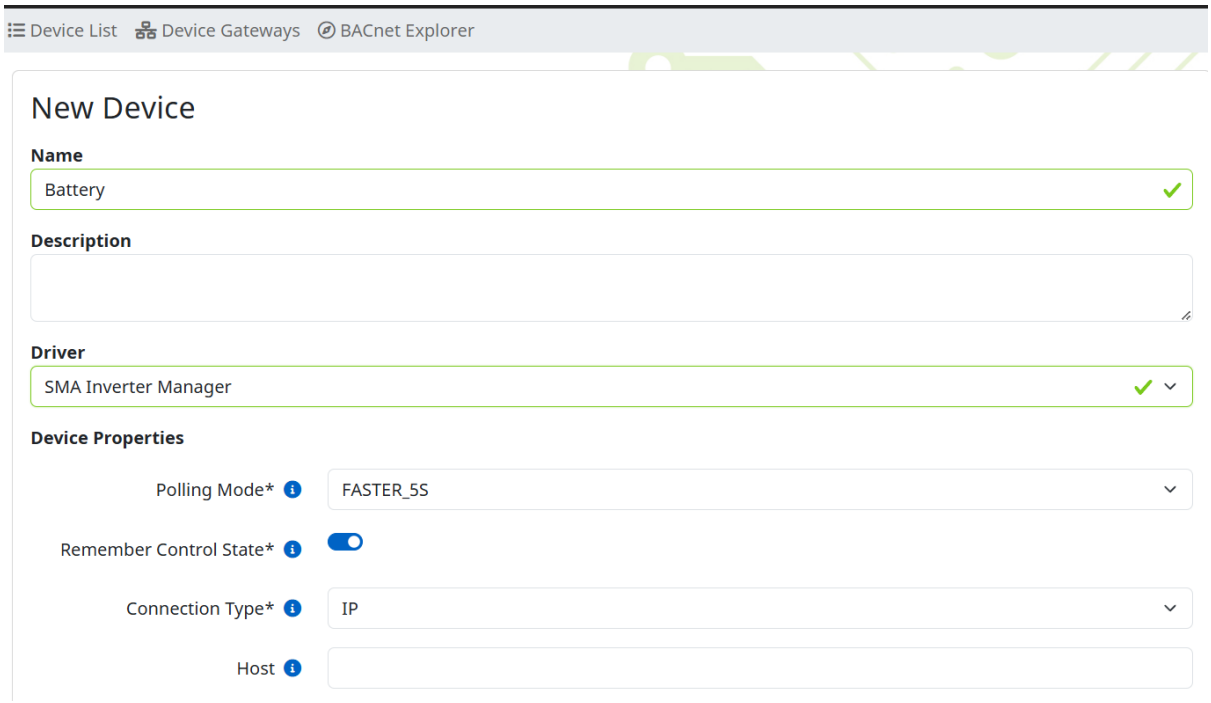
Device	Driver	Key Settings
Battery	SMA Inverter Manager	IP Address of the Inverter Manager on LAN1
Battery Meter	SMA Inverter Manager Battery Meter	Parent Device is the Battery
Grid Meter	Janitz IMG 604-PRO Power Meter	IP address of the Janitza meter Polling Mode: FASTEST_1S
Battery Balancer	Battery Balancer	Polling Mode: FASTEST_1S
Solar Meter	Depends on the metering installed	
Solar Aggregate	Aggregate Meter	Place all the solar meters underneath a single aggregate meter

5.1 Battery and Battery Meter

Navigate to Devices and add a new device.



Select the driver "SMA Inverter Manager", name the device "Tesvolt Battery" and apply the following settings:



Setting	Recommended Value
Polling Mode	FASTER_5S
Remember Control State	True
Connection Type	IP
Host	The IP of the Inverter Manager on LAN1
Port	502
Keep Alive	True
Battery Control Mode	BATTERY_MANAGED
Max Power (kW)	This is the max discharge power of the system which is 60 * Number Inverters
Max Capacity (kWh)	This is the total installed storage capacity
Rack Count	Leave this set to 1. (Deprecated Parameter)
Soc Limit	True
Maximum SOC	99%
Minimum SOC	2%
Power Smoothing Minutes	1

Add another device, call it “Battery Meter” and choose the driver “SMA Inverter Manager Battery Meter”. Select the “Battery” device you just created as the parent device.

5.2 Grid Meter

Add a new device, call it “Grid Meter” and use select the driver “Janitz IMG 604-PRO Power Meter”. Set the IP address to the fixed IP address of the Janitza meter and choose “FASTEST_1S” for the polling speed. All other settings can be left as default.

5.3 Battery Balancer

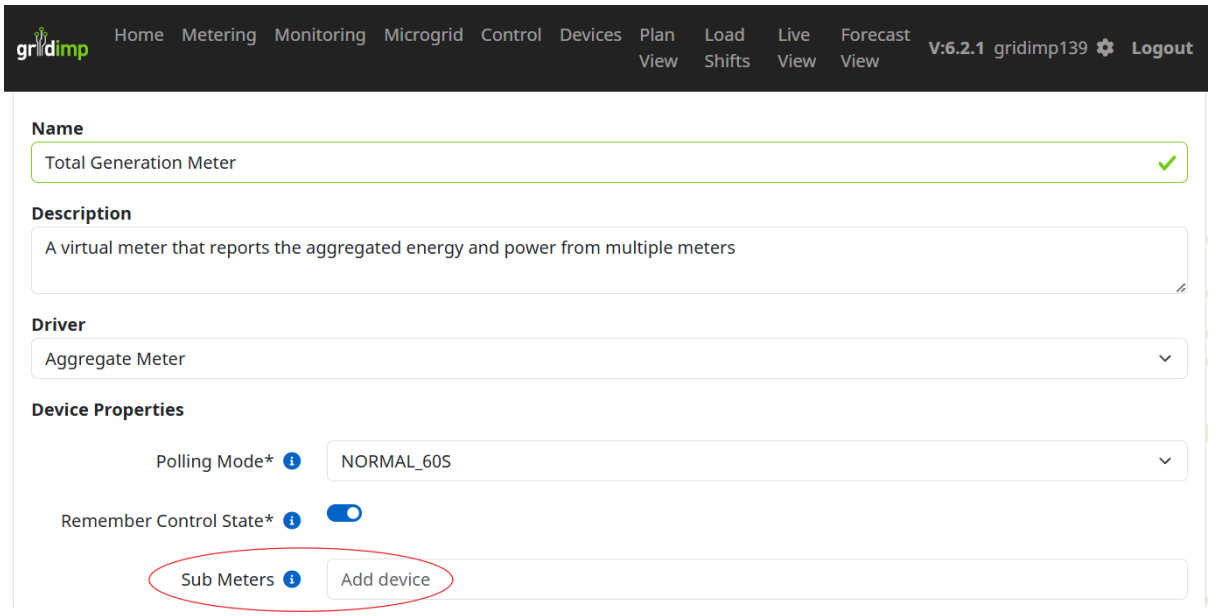
Add a new device, call it “Battery Balancer” and select the driver “Battery Balancer”. Apply the following settings:

Setting	Recommended Value
Polling Mode	FASTER_5S
Remember Control State	True
Batteries	Add the battery defined in the previous step
Balancing Meter	Add the Janitza meter, this meter needs to be monitoring the power at the grid connection point
Max Import Power (kW)	The maximum allowed import power for the site at the grid connection point
Max Export Power (kW)	The maximum allowed export power for the site at the grid connection point
Charge Percent	50%
Discharge Percent	50%
Reading Timeout Minutes	5
Safety Margin	10%
Default Peak Setpoint	0
Default Soak Setpoint	0
Default Balancing Point	0
Pid (Type,Kp,Ki,Kd)	Not needed for BATTERY_MANAGED mode
Has Curtailment	False

5.4 Solar Metering

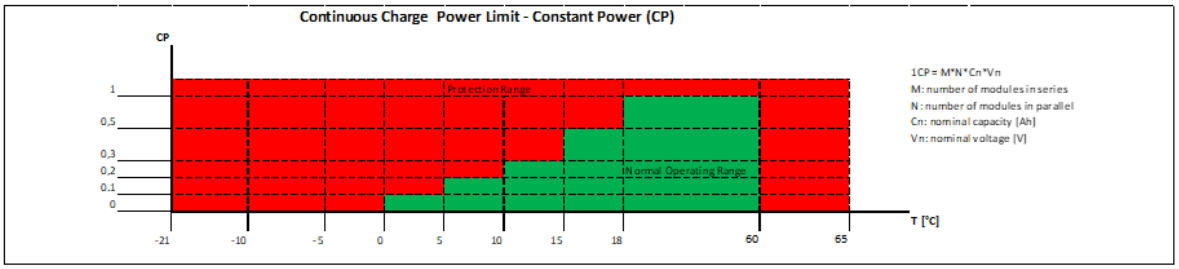
Add devices for your selected solar metering. These may be the “Inveo Nano Energy Meter” for the Nano pulse counter, or for example the “Accuvim II Power Meter”. Refer to the equipment note for the metering you have selected for how to configure the meter and associated Gridimp device driver.

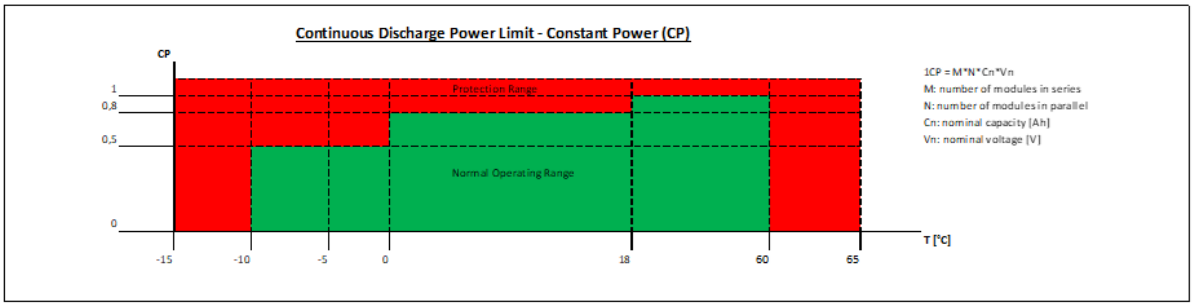
If there are multiple solar generation meters, then create a device called “Total Solar Generation”, using the “Aggregate Meter” driver and add each of the solar meters as sub-meters to this device.



5.5 Temperature Monitoring

Note that Battery Energy Storage Systems, need to be installed in a temperature controlled environment, to maintain warrantee and performance criteria. The temperature control should include both active heating and cooling and the room or containment should be insulated. If the temperature drops below a certain threshold the power will reduce and lower still the device will stop responding. The graph below shows the temperature effect on the power. Optionally, you may install a temperature sensor in the battery room, using for example the Inveo Nano Temperature and connect this to the hub for additional monitoring.

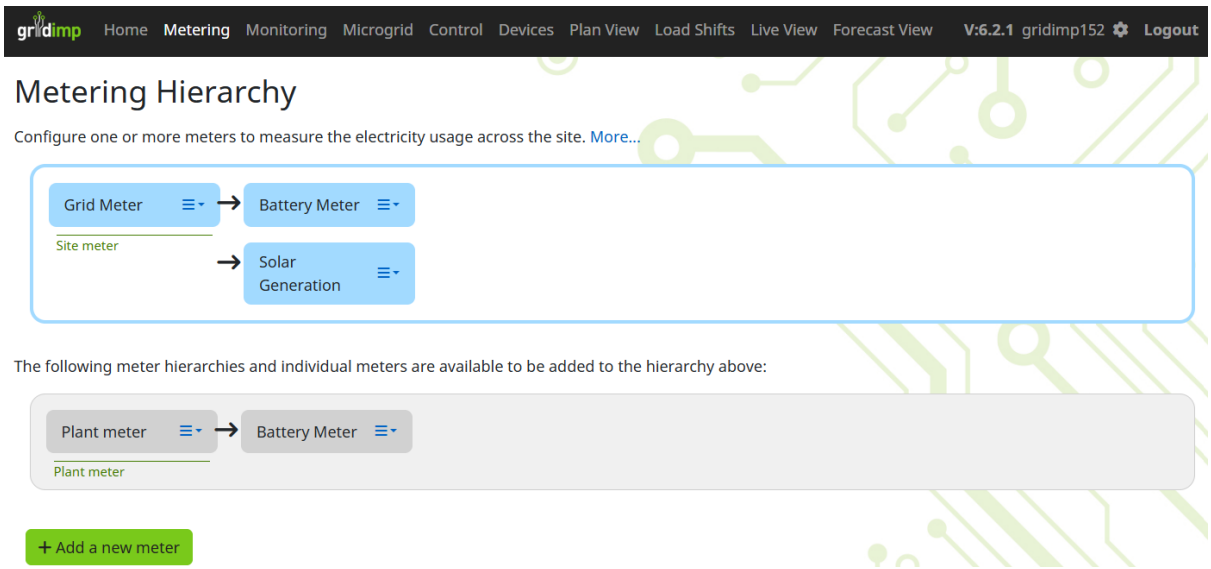




+2°C temperature measurement tolerance must be included

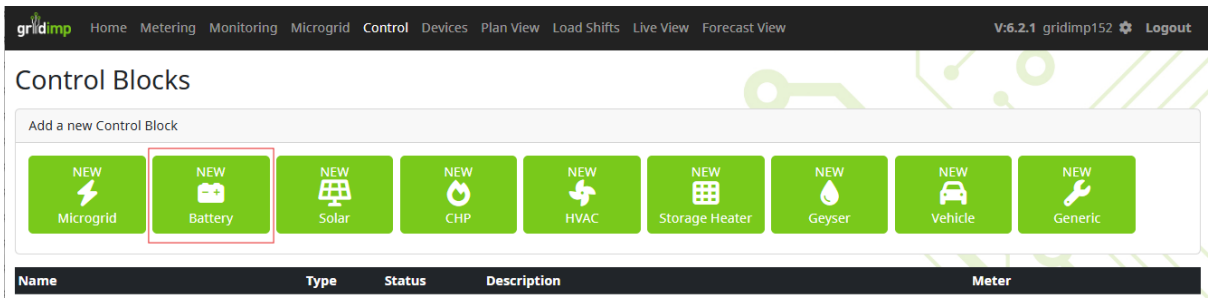
5.6 Metering Hierarchy

Next you need to configure the metering hierarchy. Navigate to the page “Metering” and select the “Grid Meter” you setup for the Janiza as the “Site Meter”. Then add below this the “Battery Meter” and “Total Solar Generation” that you created.



5.7 Battery Control Block

Navigate to the Control page and click on the “New Battery” to add a new battery control block. Name the battery control block “Battery Control Block” and use the following settings:



Setting	Recommended Value
Meter	Battery Meter
Minimum Reward (p/kWh)	7p/kWh – you can adjust this to represent the amortized cycle cost of the battery if this information is available
Carbon Intensity (gCO2/kWh)	0
Battery Policy	MCP1 – Variable Tariff MCP2 – Flat Tariff
Balancing Meter	Grid Meter
Balancer Device	Battery Balancer

5.8 Solar Control Block

If there is solar generation on site, then navigate to the Control section on click on the “New Solar”. Name the battery control block “Solar Control Block” and use the following settings:

Setting	**Recommended Value**
Meter	Total Solar Generation
Forecast Name	Solar Forecast
Latitude	The Latitude of the Site (You can find this on impCloud under the associated Fiscal Meter)
Longitude	The Longitude of the Site
Elevation	Elevation of the site, default value is 20m
Timezone	The timezone of the size default is “EUROPE_LONDON”

You then need to specify the installed system, in terms of inverters, strings and panels. Note that you must select “open rack” for the rack type.