Axpert Settings

The Axpert/Mercer MKS series inverters are due to price, one of the most popular inverters in South Africa. The manual is a bit ambiguous at times, and this is my attempt to make the settings on the menu a bit more understandable.

The menu settings can be accessed through the LCD screen and via the software (both propriety software and third party software). The menu on the LCD is selected by pressing the Enter key for 3 seconds. Menu items are selected using "UP" or "DOWN". Changes are made by pressing Enter and then selecting options using "UP" or "DOWN" and confirmed with the Enter key. To exit the menus press the Escape key.

Program 1 Load priority

Ut⼀ – **(default)** Inverter prioritises it load to be supplied from the grid/utility. In the event of grid power not being available load will be supplied using solar and battery energy.

SbU – Inverter prioritises load to be supplied by first solar and if that is insufficient augmented by battery until battery voltage drops to either the low battery voltage (**Program 29**) or back to grid voltage (**Program 12**). The inverter then will revert to grid and be in bypass mode. **(This is my recommended mode)**

SOL – is exactly the same as SbU above with the exception that it will revert to utility once solar production is zero. i.e. The inverter will prioritise loads from solar and battery until sunset and then it will go to grid (bypass).Unfortunately it not particularly intelligent and so if your panels are producing 30W it will not go over to utility even though solar is not really supplying the load.

Program 2 Maximum charging current

Maximum charging current ranges from 10A to 120A on the various models. Find out about charging rates and understand them. A good place to start would be 10% of you battery bank's Ah rating. For example if you have a 440 Ah bank then 10% would be 44A. But the inverter charge rating is in steps of 10A so you would plum for 40A. Once you know enough about your batteries you can further refine this setting. Note this setting for total charging and only the 4KVA and 5KVA models have combined solar and AC charging so in effect this is the maximum solar charging on smaller models.

Program 3 Appliance mode or UPS mode

APL **(default)** or UPS Appliance mode or UPS mode. This is setting is badly named and causes some confusion. The setting has got to do with the incoming utility power. UPS is the preferred setting but if you are running a generator or your grid supply is poor you may not be able to run in UPS mode and then you have no option but to run in Appliance mode. If your inverter still will not connect to a generator check your firmware. Some versions of firmware are troublesome with generator power.

Program 4 Power saving mode

�5d5(default) or 5E⊓ –Power saving disabled/enabled. This setting is supposed to switch off the output of the inverter if the load is low or not detected. I have seen a smaller unit achieving this, but not the larger units. Play with the setting if you want to but I have left mine disabled.

Program 5 Battery type

AⅬn (default) – AGM battery - bulk charging preset to 56.4V and float is preset to 54.0V (28.2V and 27V respectively for a 24V system).

FLd- Flooded lead acid battery –bulk charging preset to 58.4V and float is preset to 54.0V (29.2V and 27V respectively for a 24V system).

U5E – User defined if this is selected and I think you should then you can set bulk charging voltage and float voltage in **Program 26** and **Program 27**. The range you are allowed is 48.0V to 58.4V for a 48V system and 24V to 29.2V for a 24V system in increments of 0.1V.

Program 6 Auto-restart disable/enable

Lrd (default) LrE –A matter of personal preference really. I have left it disabled as I would want to know if the inverter had switch off for some reason.

Program 7 Auto-restart over temperature disable/enable

trd (default) trE –As above

Program 9 Output frequency

50Hz.

Program 11 AC Charging

Charging using grid/Eskom. The setting varies from 2A to 60A depending on the model. This setting should not be higher than the setting in **Program 2**. You can set it higher but you may well find you inverter misbehaves as one now has conflicting settings. The larger 5KVA model has a 2A charge setting which would be useful in maintaining batteries once they are in float.

Program 12 Back to grid voltage

This setting is dependent on the selection of 5bU or 5OL in **Program1.** A battery voltage of 48V would roughly be a DOD of 50%. This however is a very poor approximation and third-party software such as SolarMon was written to address this issue.

Program 13 Back to battery mode

This setting is dependent on the selection of `5bU` or `5OL` in **Program1. Program 13** is used in conjunction with **Program 12**. A value above 54V would ensure that at least your batteries are charging before going back to battery mode. The functionality of these two settings is the reason third-party software such as SolarMon was written. **USE this with care and make sure you understand the implications.**

Program 16 Charger source priority

`C5O` -Solar used to charge batteries. Utility will be used if solar is not available

`CUt` –Utility used to charge batteries. Solar energy will be used only if grid is not available.

`5nU` –Solar and Utility charge batteries at the same time.

`O5O` – Only Solar will be used to charge batteries. Grid will not be used even if it is available.

These settings will probably need some thought. For most installations `C5O` and `O5O` would probably be the most popular.

Program 18 Alarm control

Easy you either want the alarm on (`bOn`) (**default**) or off (`bOF`)

Program 19 Return to default LCD screen

`E5P`(**default**) or remain on the last user screen (**sorry cannot seem to replicate the 7 segment display's symbol. Looks a bit like** `hEP`)

Program 20 Backlight control

`LOn`(**default**) on or off `LOF`

Program 22 Beeps when primary source is interrupted

Beeps when the solar production ceases at sundown and beeps if utility fails while grid is being used.

`AOn` (**default**) on or off `AOF`

Program 23 Overload bypass

If an overload occurs in battery mode switch to grid mode. My thinking is that this should be enabled (`bYE`). The default is disabled (`bYd`).

Program 25 Record fault code

My thinking is that this should be enabled (𝖥𝖤𝗡). The default is disabled (𝖥𝖽𝖲).

Program 26 Bulk Charging voltage.

If you have selected 𝖴𝖲𝖤 in **Program 5** you can set the Bulk Charging voltage between 48V and 58.4V(24-29.2V for 24V system). Consult you batteries' datasheet.

Program 27 Float Charging voltage.

If you have selected 𝖴𝖲𝖤 in **Program 5** you can set the Float Charging voltage between 48V and 58.4V (24-29.2V for 24V system). Consult you batteries' datasheet.

Program 28 Parallel Inverters

You can ignore this setting for single inverter installations.

Program 29 Low DC Cut-off voltage

You have a range from 𝟦𝟢 V to 𝟦𝟪 V for the 48V system and 𝟤𝟢 V to 𝟤𝟦 V for the 24V system. I would recommend sticking with the defaults of (𝟦𝟤 V and 𝟤𝟣 V respectively as changing these settings interferes with State-of-Charge (SOC) readings. The highest setting of 48V is not really high enough to protect your batteries. Rather use an alternative SOC reading coupled to a relay to protect your batteries. Thanks to Edmund Pohl for discovering this anomaly and putting the information out into public domain.

Program 30 Parallel inverters

You can ignore this setting for single inverter installations.

Program 31 Solar Power Balance

𝖲𝖻𝖤 **(default)** Best to leave this on enabled.

Max PV production = Max Battery Charging (load) + Consumption (load).

𝖲𝖻𝖽 disabled MaxPV production = Max Battery Charging only. This limits your PV production to what your batteries can accept. You may not be able to use ½ of your PV capacity if this is disabled.

One of the idiosyncrasies of the Axpert is that PV voltage is reported before the MPPT while PV current is reported after modification by the MPPT. If you are looking at the LCD screen or manipulating data captured by WatchPower then:

 PV output = PV current X Battery Voltage

and **NOT** PV Current X PV Voltage.

Finally an Addendum.

Starting the inverter.

You need to start the inverter on batteries.

1. So switch on battery disconnect
2. Switch on inverter.
3. Now connect PV power.
4. Switch on AC grid power
5. Finally switch on the load.

If you need to work on the inverter and cabling or you need to shut down in an emergency then reverse the process.

1. Switch off load
2. Switch off AC grid.
3. Disconnect PV input
4. Switch off inverter
5. Disconnect batteries (**Never disconnect the batteries under load – unless in an emergency and then still try and follow this sequence or the batteries may make a bad situation worse).**