Troubleshooting Via M&C

Info Tab

The Info tab provides basic information on each IBUC. It may be important to note what version of firmware the unit is on. New firmware is released regularly. The latest firmware can be found at www.terrasatinc.com/product-manuals. It is important to follow the firmware installation instructions exactly. For an up-to-date firmware changelog, please email techsupport@terrasatinc.com.
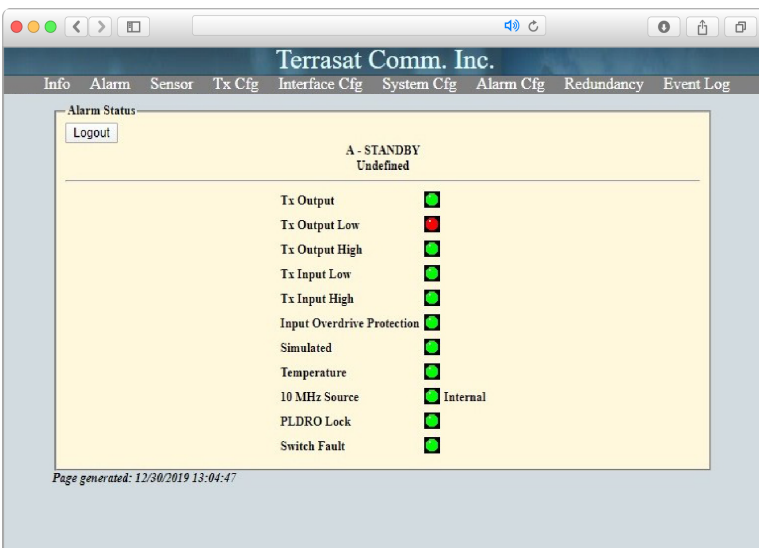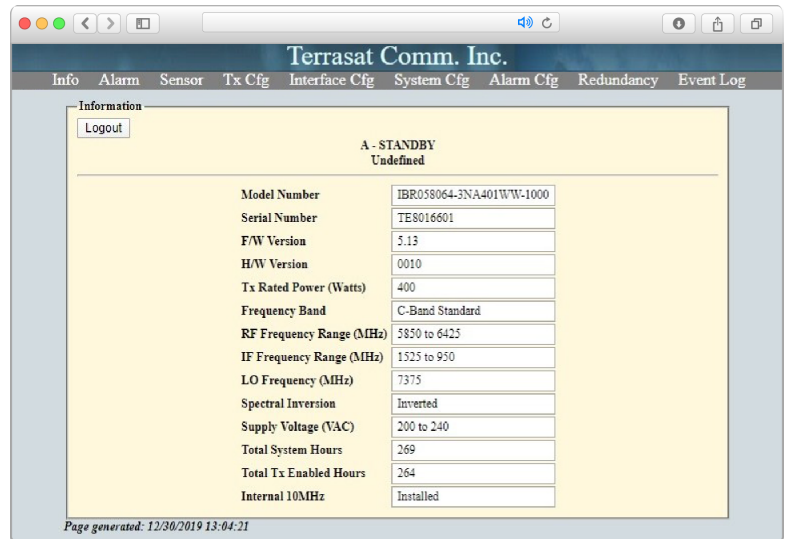
Alarm Tab

These alarm indicators are tied to alarm thresholds that can be configured in the Tx Cfg tab. If left on default, a "Tx Input Low" alarm means the modem has dropped. This will cause a "Tx Output Low" alarm & the "Tx Output" will disable/mute.

A common occurrence is the loss of 10 MHz reference from the modem. This will cause the PLDRO to unlock. This will cause several alarms & mute the unit. The key alarm to clear first is the 10 Mhz. If the PLDRO is unlocked and the 10 MHz is present, then the PLDRO will need to be re-tuned. The re-tuning must be done by qualified personnel, generally at the factory.

A "Tx Output High" alarm on the default setting means that the unit is over its maximum limit. You will probably never see this as Terrasat units ship with input overdrive protection installed which will prevent the output from going over the upper limit. On the other hand, a "Tx Input High" alarm on the default setting means that the modem is overdriving the unit. There should never be a time that the IBUC requires more than -30 dB (+/- 1 dB) of input from the modem. That is -30 dB at the IBUC. That reading can be seen on the Sensor tab. Oftentimes an operator will overdrive the unit to gain an extra half dB of output, but to get there they drive the modem as high as possible. The IBUC can't use this and at -15dB the detector ceases to give real readings as the mechanical sensors are pushed beyond their limit. You will get a "Tx Input High" alarm for this. This also means the unit is being compressed & this usually results in a poorer signal. If a customer needs more power,

Alarm Tab Continued

then they need to purchase a higher-powered unit.

A temperature alarm will result in a shutdown. The unit will automatically resume transmission once it has cooled down by 20 degrees Celsius. This alarm will probably only happen if the fan is broken & the unit will continue to overheat and shutdown. The devices in the unit are rated to withstand significantly higher temperatures than what we configure the alarm/shutdown for. This is to preserve the devices. If a unit continues to overheat, the first step is to check the fan. If a unit does not have a fan but is deployed to an extremely hot environment, it is recommended that the customer purchase a fan. All Terrasat units, even those that do not come with a fan can use one of our fan assemblies. These are easy to install in the field.

The AGC & ALC range alarms only occur if AGC or ALC are configured & the modem has driven these algorithms out of range. This would happen if the modem dropped or was being overdriven. First step would be to ensure the modem is functioning as planned, then disable AGC or ALC and find the desired output of the unit. Then enable AGC or ALC.
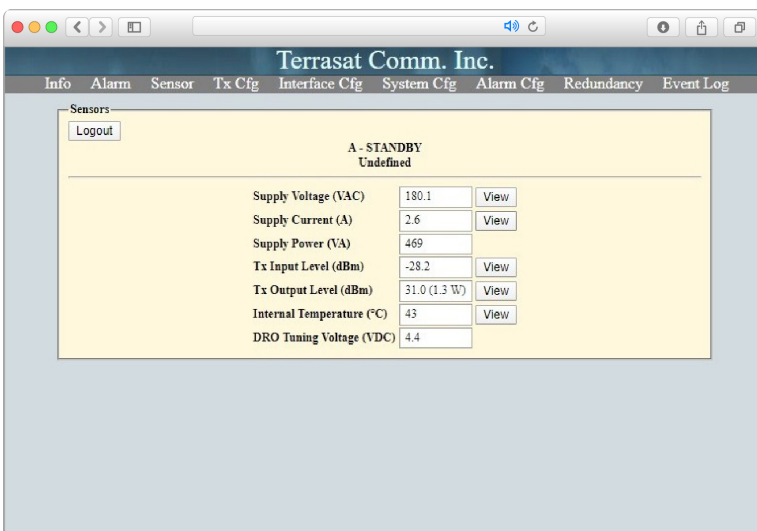
Sensor Tab

From the Sensor tab we can determine if a unit is performing up to spec. When consulting the Sensor tab, it is best to have the data sheet for the model on hand. From the consumption numbers we can determine if a unit has a blown stage in the amplifier. Sometimes a unit will consume slightly less than the spec, so it doesn't automatically mean that the amplifier is damaged.

The easiest way to determine that a unit is operating up to spec is to take the difference between the Tx Input & Output Levels & add that number to the attenuation setting from the TX Cfg tab. Compare your results to the data sheet gain number.

In lower power units a blown stage in the amplifier will result in no output power. When larger units have a blown stage, there should be about a 4 dB loss per blown stage compared to the Gain and Output spec.

If you see a loss of around 20 dB, then an attenuator has been blown.

The DRO tuning voltage should be around 4 to 5 volts. The newer units don't drift as much but some of the older units can drift after several years. If you have a unit that has 10 MHz present (green on the Alarm tab) but has a PLDRO alarm, check the Sensor tab. If the DRO voltage says is close to the rails (0 and 9 volts) then the DRO needs to be re-tuned.

Tx Cfg Tab

The manual is the best resource for understanding what each setting on the Tx Cfg tab does.

Commonly reported faults that can be remedied on this tab are units that won't power up at startup/restart, intermittent alarms resulting from a burst uplink & thresholds being set to high or low & causing the unit to register an alarm.

If a customer has restarted a unit & cannot get power output, have them ensure that Tx Output is "Enabled" & that they have the Tx State at Powerup set to "Enabled".

If a customer is operating a TDMA/Burst link, then they need to have the Power Read Mode set to "Burst". If the link is continuous then they need to have it set to "Continuous". If

they are operating with a "Continuous" setting while operating a TDMA/Burst link, then they will see input alarms which cause the output alarms every time the burst stops transmitting from the modem.

The thresholds need to be set accordingly, so high needs higher than the input/output & low needs to be lower. We recommend 2 to 3 dB higher & lower than the output/input reading. The above thresholds are the default settings. If a customer has an incorrect threshold setting, then they will get a false alarm. So as an example, they set the Tx Input High threshold at -33 dBm & they are driving -30 dBm into the unit, they will see a Tx Input High alarm.

Interface Cfg Tab

You will rarely see a problem with an IBUC that takes you to the Interface Cfg tab. If the customer has the right IP addresses, then they should be fine.

If the customer does not have their IP address or, password then contact Terrasat Tech Support. There is no "reset button" on the unit to wipe out the IP or password and restore it to defaults. Terrasat will need the serial number of the unreachable unit to get the superuser password. We also have a couple guides that allow you to find the IP of a unit. The easiest way being to download Wireshark & have it search the network for connected IPs. If you do this via a laptop that is only connected to the IBUC, then Wireshark should return only the IBUC IP.

System Cfg Tab

Please refer to the manual for further explanation of the settings on this page.

It is doubtful that any setting on the page will ever come up in troubleshooting.

However, it is recommended that when a unit is installed, the user configure a new password as well as change the time and date settings. The alarm log will register when alarms happen with a time and date stamp, so accuracy is important.
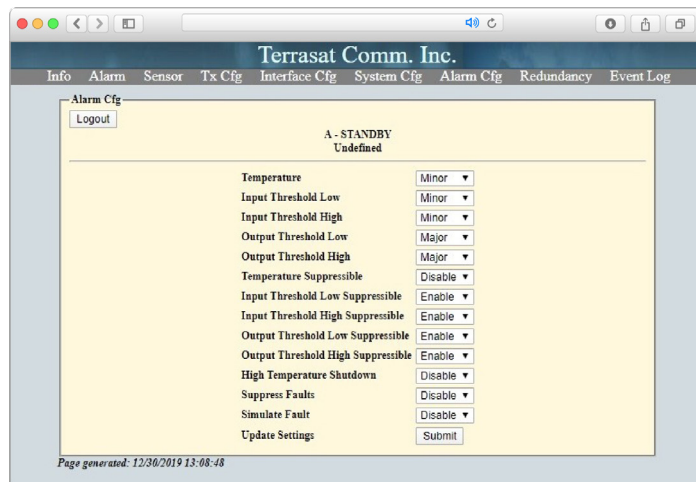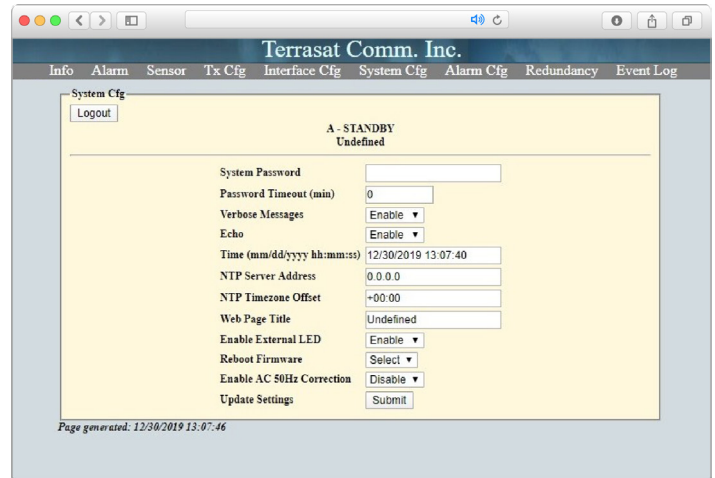
Alarm Cfg Tab

The Alarm Cfg tab is where a user can set the severity of alarms. Terrasat recommends that default settings be used. Rarely a user will suppress all faults or suppress a Tx Input High because they feel they must overdrive the unit. Terrasat recommends using the Simulate Fault toggle for fault testing. For example, if a user is testing the switching function of a redundant system, they shouldn't start pulling cables from the online side. The unit won't be damaged if they do, but it is easier to simulate a fault.
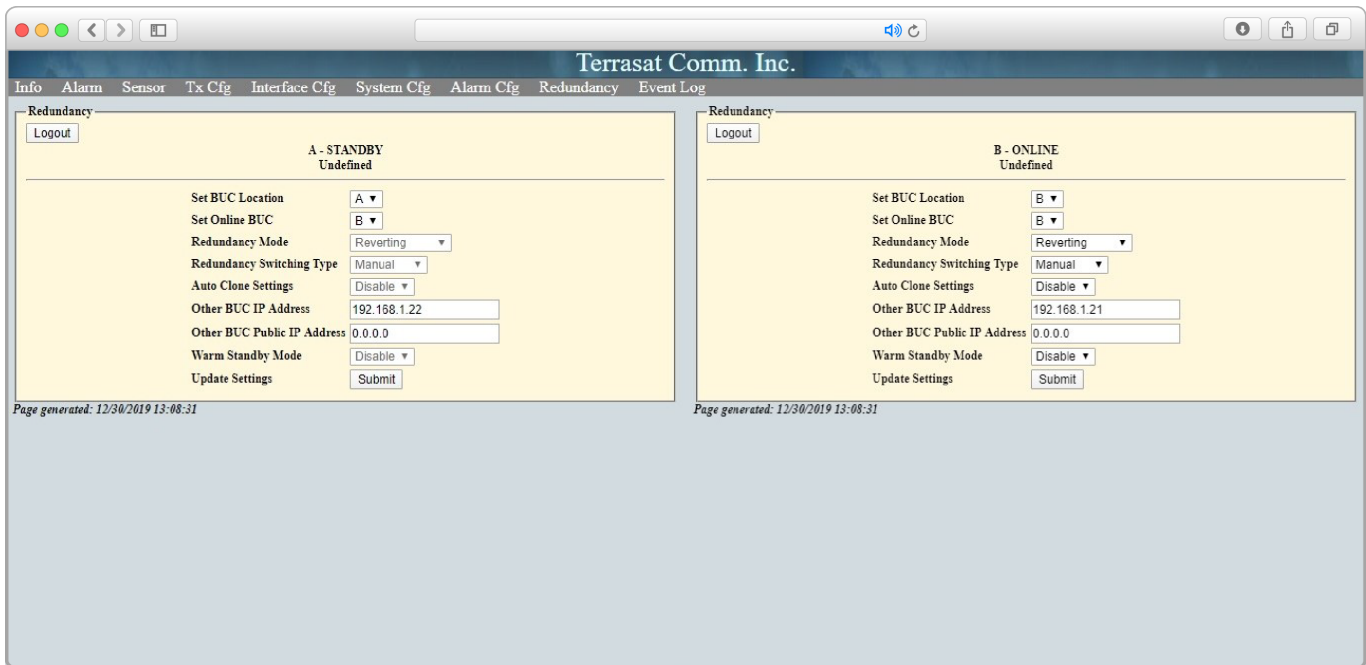
Please consult the manual for further explanation of each setting.

Alarm Log Tab

The Alarm Log is where alarms and events are documented. Entries are self-explanatory.

The entry "EHZ" means the alarm log was cleared.

Redundancy Tab

The most common fault that users see with redundancy is having the units set to incorrect locations or having the wrong IP addresses. Users may also have cables crossed. When cables or settings are crossed A & B swap places, so if a user is trying to mute B to force a switch to A, it won't do anything, and it will fault both because the redundancy isn't configured properly.

Also, if a user sets the Redundancy Mode to "non-reverting" the unit will not recover two times. So, if A is online and it faults, the unit will switch to B. If B, then faults it will not switch to A. We always recommend "Reverting".

When using "Warm Standby" the user should intend to shutdown one of the two amplifiers in a redundancy configuration. The way to use "Warm Standby" is by setting the A side as the online side, then enabling "Warm Standby." The user should have setup the system properly with power balancing before doing so. Once the system is put into this mode, it can only switch over to the offline side one time. The system will automatically be configured as non-reverting because we do not allow the system to freely swap to a faulted side. If the A side fails while Warm Standby is enabled, we presume it is still faulted. In order to get the system back to the original configuration with the A side as the online, the user must manually set the A side as the online again.

As a note, you cannot automatically switch to a faulted unit.

RX 1+1

The Receive Redundant System is even simpler to troubleshoot. The tabs are the same layout as the IBUC webpages with many of the same configurations.

The most common problem is a user having cables crossed and confusing the system. There is a switch between the LNBs and there is one inside of the RX1+1. The user will have the RX1+1 setup with A and B sides designated correctly, but then they will cross the cables and this conflicts with the external switch, so redundancy doesn't function. All the customer must do is uncross the cables.

The interface box is a passive unit. If for some reason the interface box isn't setup to power the LNBs, it will still pass the signal through even if the unit is turned off. Because of this, when customers report "low output" you should look at the cables, connectors or the LNBs themselves. Maybe the LNB has gone bad, or a cable is damaged, or a connector is corroded.

LNBs should have roughly the same consumption and "off satellite" Rx Input Level. If one LNB consumes substantially less power or has less input level, then have the LNB and cabling checked.

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