

Trimax SM-2200 Signal Meter

Satellite Signal Finding Made Easy

If you're a satellite antenna installer, you want your job to be as easy as possible especially if you have to climb up on a roof to install that dish. You would like to go up and down that ladder as little as possible. Sometimes the most difficult part of the entire job is not erecting the antenna, but finding that elusive satellite that the customer wants to receive. Of course, you could carry that bulky satellite spectrum analyzer up there with you but what if there was any easier way? Trimax may have just what the doctor ordered.

Trimax recently introduced a sophisticated handheld signal meter that should greatly simplify an installer's job. Thanks to Jerry Fisher at SatMan Canada (www.satmancanada.com) who sent us a sample, we had the opportunity to take a closer look at this meter. At only about 1.25 LBS (0.5 Kg) and with dimensions of 9.5 x 15.5 x 4.5 cm, it is small and lightweight enough to easily carry around almost anywhere. The internal electronics are surrounded by a sturdy black plastic housing. The meter is powered by a 1950mA rechargeable Li-On battery.

The SM-2200 is fitted with a single male "F" input connector on the top side and a USB serial interface connector plus DC power port on the bottom. The USB connector and DC power port are protected from dirt and moisture by rubber protective flaps. Included in the package are an AC charger, a DC car charger, a female-to-female "F" connector, a black protective carrying case and convenient shoulder strap. Also included is

TELE-satellite World [www.TELE-satellite.com/...](http://www.TELE-satellite.com/)

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Turkish	Türkçe	www.TELE-satellite.com/TELE-satellite-0807/tur/trimax.pdf

a PC cable with an RS-232 connector on one end for a PC and a USB connector on the other end to plug into the meter. Lastly, you'll also find a 15-page user manual for the SM-2200.

Everyday Use

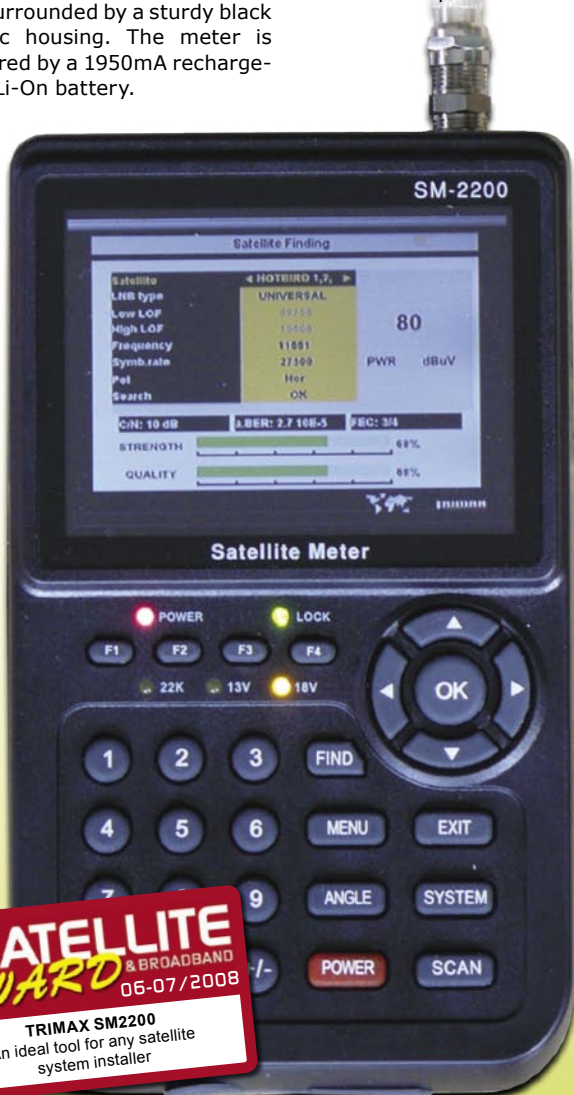
When charging the meter for the first time, the manufacturer recommends charging the internal battery for at least 5 hours before using the meter. The universal AC charger is rated for 90-240VAC/50-60Hz operation that, with the correct wall outlet adapter, lets you use the SM-2200 almost anywhere in the world. The DC car charger can be used to charge the meter while on the road. Just plug the charger into your vehicles 12VDC power port and the meter will recharge while enroute to your next installation job. The meter does not need to be turned on while the battery is being charged; the power LED on the front panel will glow green to show that charging is taking place. It will turn red when the meter is fully charged.

The satellite signal is supplied to the meter via the male "F" connector on the top side of the housing. You might be wondering why the manufacturer installed a male "F" connector and supplied a female-to-female "F" connector in the package instead of just installing a female "F" connector. The idea was that the exposed threads of a female "F" connector were far more likely of becoming damaged over time. In such a case, it would have probably involved

taking the meter out of service to repair or replace the female "F" connector. Instead, when the threads become damaged, it is a simple matter of removing the existing female-to-female "F" connector and replacing it with a new one. Obviously, the manufacturer was thinking ahead when they came up with this idea.

The front panel of the SM-2200 comes with 28 buttons to operate the meter. These buttons include a numerical keypad, four function buttons, four left/right/up/down ring buttons surrounding an "OK" button plus a set of buttons to access specific points in the meter's menu. And let's not forget the main power button. There's also a set of five status LEDs: a power indicator, a signal lock indicator, a 22 kHz indicator as well as 13V and 18V polarization indicators. But, without a doubt, the most prominent feature on the front panel is the 3.5" TFT LCD screen. Not only can you view all the different menu pages right on this screen, but you can also watch and listen to satellite TV channels directly on the SM-2200! This virtually guarantees that the satellite you want is the satellite you get.

Once the meter has been fully charged, hold down the red power button for about one second to turn the unit on. If you are turning on the meter for the first time or if the meter has been reset, the registration code that comes with the package needs to be entered. From this point on, the meter will take



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TRIMAX SM2200
An ideal tool for any satellite system installer



Meter with accessories

you directly to the Main Menu screen every time it is turned on. Next the meter needs to be set up for the area it will be used in. From the Main Menu screen use the arrow keys to scroll down to System Setting and press the OK button. If the meter happens to be in TV mode, the System button on the front panel can be used to go directly to the System Setting screen. From the System Setting screen, you can select the proper language (English or Russian), the correct TV standard (NTSC, PAL, SECAM or AUTO) and set up the timer to shut down the LCD screen after a user-settable time (5, 10, 15 or 20 minutes). For our initial test we wanted to use the meter to align our dish to Galaxy 25 at 97° west. So we selected English as our menu language and NTSC as our TV standard. From the System Setting screen you can also Factory Reset the meter and view the current software loaded in the meter. Once all the settings have been taken care of, the Exit button will take you back to the Main Menu.

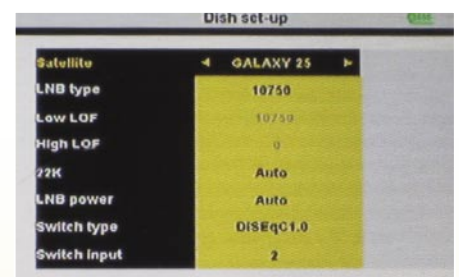
With the system settings taken care of, your next logi-

cal step would be to enter the proper antenna settings into the meter. From the Main Menu screen, scroll to Satellite Setting and press the OK button and then scroll to Dish Set-up and press the OK button again. The Dish Set-up menu lets you choose a satellite and adjust its parameters so that the meter can properly receive a signal from the antenna. With the satellite name highlighted, we used the left/right arrow keys to select Galaxy 25. We were using a standard Ku-band LNB on our dish with an LOF (local oscillator frequency) of 10.750 GHz. In the Dish Set-up menu we scrolled to LNB Type and used the left/right arrow keys to select 10750. Other preprogrammed LOF settings include 5150, 9750, Universal and Customized. The Customized setting can be used to set up a different LOF such as the 11.250 GHz LOF used by the North American DTH satellite services. In the case of the Universal setting, the Low LOF, High LOF and 22 KHz settings are automatically adjusted for you. The LNB power can be used to force the meter to stay at either 13V or 18V regardless of what polariza-

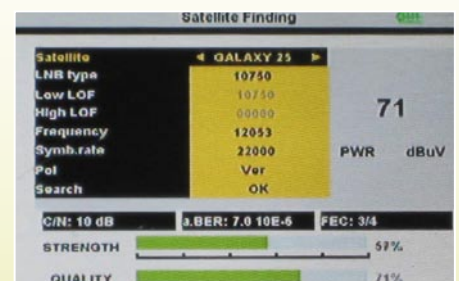
LNB power completely. In the Auto mode, the meter selects the proper voltage based on the polarization.

The antenna we want to align is routed through a DiSEqC 1.0 switch so the meter needs to be set up for this as well. From the Dish Set-up menu we scrolled to Switch Type and pressed the left/right arrow keys until DiSEqC 1.0 was displayed to activate this function in the meter. We selected #2 under Switch Input to match the #2 input used in our DiSEqC switch. Once these settings were taken care of, the Exit button was pushed and OK chosen to save the settings.

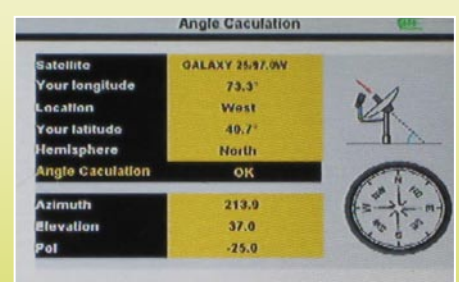
At this point the meter is ready to find satellites for you. The day we were outside to test the meter was cloudy so the video display was easy to see. But, even on those bright sunny days, the included sun screen helps make the video image viewable. For our first test, we wanted to see how easy it would be to find the Galaxy 25 satellite at 97° west. The meter came preprogrammed with all the transponders on this satellite so it was just a



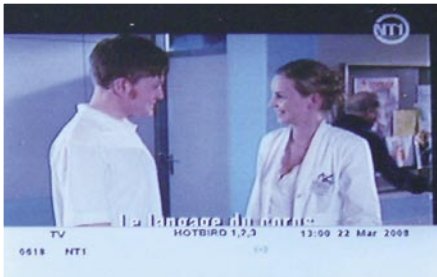
Dish set-up |



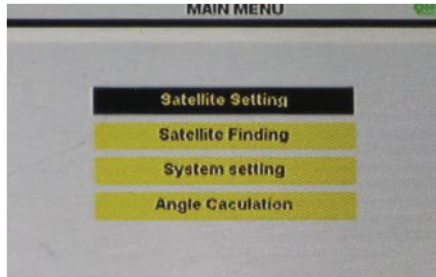
Satellite finding |



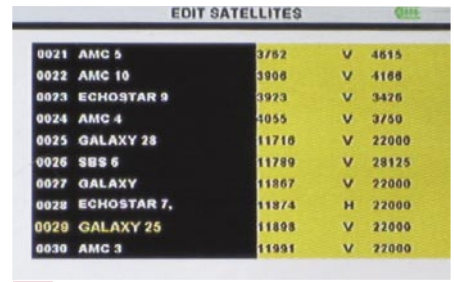
Angle calculation |



Info bar |



Main menu |



Edit satellites |

matter of choosing which one to work with. From the Main Menu screen we highlighted Satellite Finding and pressed OK. This took us to the Satellite Finding screen from which we could select the satellite we wanted to look for and the transponder we wanted to use for this task. If a known active transponder is missing from the list, you can use the Satellite Finding screen to edit an existing transponder and put in the missing data. Just keep in mind that doing this will overwrite the existing data for that particular transponder. Unfortunately, it was not possible to add new transponders to a satellite through the meters menu screens; only existing transponders could be changed. Adding new transponders would involve using an interface program made available through the Trimax web site (www.trimaxmeters.com) and then uploading the new data to the meter through its USB port.

We opted for the 12.115V transponder and began by rotating our 90cm antenna in the general direction of Galaxy 25. In no time at all the signal strength and quality bar graphs on the Trimax meter display came to life announcing that we had found our target satellite. In addition to these two bar graphs, the display on the meter also shows the power in dBμV as well as the C/N and BER values to make fine tuning of the antenna a piece of cake. This information gives an installer an extra level of precision when aligning an antenna that could not normally be achieved using the signal strength and quality bar graphs alone.

If you're not exactly sure where a satellite is located in the sky, the meter also comes with a handy Angle Calculation tool to point you in the right direction. Simply go to the Angle Calculation screen from the Main Menu, enter in your local longitude and latitude coordinates and select the satellite you want to find. The tool will calculate the azimuth and elevation angles needed for that satellite.

Once the alignment is completed, a channel scan of the

transponder can be started by scrolling down to Search and pressing the OK button. All of the active channels on the transponder were found and stored in the meter in just under 10 seconds. By exiting out of the on-screen menus, the channels that were just stored can be viewed. The up/down arrow keys can be used to switch between channels or you can press the OK button to display a list of the available channels. The left/right keys adjust the volume in full-screen mode and act as page up/down buttons when in Channel List mode. In the Channel List mode, the video of the current channel is shown in an insert. Scrolling through the list automatically shows the video of the highlighted channel. Pressing OK again places the current video back into full-screen mode.

The quality of the video is actually quite good; even the audio is good when you consider that this a satellite meter! Switching between channels takes about one second and just like a standard satellite receiver, an Info bar that provides some basic channel information is momentarily displayed at the bottom of the screen. We also tested the meter on several SCPC transponders and found that the Trimax had no trouble dealing with these lower symbol rates.

Conclusion

Its small size and light-weight design lets you take the Trimax SM-2200 right up to an existing or newly-installed dish antenna regardless of whether it happens to be on the ground, on a wall or on a roof. It is easy to hold in one hand and the menus are quite legible on the 3.5" display. It would make an ideal tool for any satellite system installer. There will undoubtedly be satellite hobbyists out there that will "have to have" this meter to add to their collection; from their point of view, this meter is a portable satellite receiver that they could use together with a small satellite dish anywhere they happen to be. Unfortun-

ately, its price tag is somewhat higher than a standard satellite receiver and this might chase some of them away.

The long-life battery will almost guarantee that you won't run out of power in the middle of your installation and, should it need a charge in the field, simply plug it into your vehicles cigarette lighter with the sup-

plied car power adapter. It would have been nice to be able to add new satellites and/or transponders while in the field. Hopefully a future software upgrade will take care of this minor inconvenience. Overall, though, the Trimax SM-2200 satellite meter is a reliable tool that will reduce much of the time needed to align a satellite system. It doesn't get much easier than this.

Expert Opinion

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Small size, light weight, and long-life battery makes it an ideal companion to any satellite installer

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New transponders can only be added via software upload



Ron Roessel
TELE-satellite
Test Center
USA

Trimax SM-2200 in Europe

When we powered up the meter and navigated through all of its menus, we quickly discovered that the western hemisphere satellites were pre-programmed into it by default. The test model we got was set up for use in North and South America. Can the SM-2200 also be used in other parts of the world?

We turned to the manufacturer's web site (<http://www.trimaxmeters.com>) and found special versions of firmware that were designed for different parts of the world: 1. Asia and South Pacific, 2. Atlantic Ocean, 3. Europe, Africa and The Middle East, 4. North and South America. The latest software version was higher than the one in our meter (1.03 vs. 1.00). We downloaded the European firmware along with the software loader, a transponder editor tool called the "Meter Tool". The firmware update went smoothly. The



The Trimax SM-2200 used as a small portable satellite tv

European satellite list included satellites from 4.8° E (Sirius) to 72° E (Intelsat 4).

We downloaded the manufacturer's satellite list to our PC, edited it a little bit with the "Meter Tool" by adding more sat-

ellites that can be received here in Europe and then uploaded it back to the meter. After setting up a test antenna in the yard, we connected the meter to see how easy it would be to align our dish. Within seconds we spotted ASTRA 1 (19.2° E) and then rotated the antenna to HOTBIRD (13° E). The meter showed the signal strength bar along with the quality bar that we used for feedback during the alignment.

If you get along with your neighbors, you can also listen to the special audio signal generated by the meter. The better the signal, the faster the beeps. The pitch of the beep stays constant and it is actually quite loud. This is a big plus for an installer working near a busy street and not necessarily in the backyard of someone's house. If you can do without the loud beeps, Trimax included the ability to shut the audio off by pressing the F2 key. We checked a few other satellites and tested FTA and scrambled channels, high and low symbol rate (over 2 Ms/sec); the meter locked onto every signal without any problems.

With the audio muted we had to rely on the screen readouts. Trimax added a practical sun shade to their carrying bag

which we found very useful. The signal bar graphics as well as the signal power value expressed in dBμV were very easy to read. However, the signal quality percentage values and C/N value were harder to read. The last two are the most important when trying to fine tune an antenna. It would undoubtedly be helpful if a future software release made these values easier to read. Also the C/N resolution of 1 dB might be good enough to align a standard antenna that isn't too big. However, if we want to align our DX antenna, a C/N resolution of 0.1 dB (or MER) would be preferable. Once the antenna was properly aligned, we performed a typical automatic channel scan much like in a standard satellite receiver. The quality of the video was surprisingly good. The colors were much better than in the laptop we were using to write this test report. Even the audio was quite acceptable considering this was such a small unit. We really didn't expect to find such high quality in a signal finder. When you start flipping through the channels, you can't help but think about taking it with you on your next camping trip. Watching TV under a tent? Why not?

Expert Opinion



Jacek Pawlowski
TELE-satellite
Test Center
Poland

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The Trimax SM-2200 is a signal finder combined with a satellite receiver. The meter has both visual and audible signals that can be used as feedback. The ability to show video is an additional plus; you can show your customer that the antenna system you just aligned is working exactly as it should. This may help in those situations when a customer is convinced that there is a problem with the antenna set up and it turns out to really be at the receiver end.

It would be nice if the manufacturer expanded the satellite list for Europe. If the C/N resolution of the meter could be increased to 0.1 dB, this would allow an installer to align reception systems that are more demanding. The meter might be easier to use if the signal quality displays were larger (C/N and signal quality percentage).

TECHNIC DATA

Distributor	Satman Canada, Winnipeg, Manitoba, Canada
E-mail	trimaxmeters@mts.net
Tel	+1-204-661-3279
Model	Trimax SM-2200
Function	Hand-held Satellite Signal Meter
Symbolrate	2-45 Ms/sec
DiSEqC	yes, 1.0
Display	3.5" TFT LCD TV screen
Satellite Input	male "F" connector
USB Interface	yes
Internal Power Source	Rechargeable 1950mA battery
External Power Supply	90-240VAC/50-60Hz