



CYCLONE TIMING MODULE MAX USER GUIDE

Getting Started

Plug in your CTM-MAX using either the primary or secondary power supply port. Connect your PC to the “network” port on the front of the unit via a standard CAT5 cable and your computers NIC card. Once you have established an Ethernet connection, you can access the web interface at the default IP address (169.254.1.1, mask 255.255.0.0).

Using the CTM-MAX Control Panel, you can now navigate the various configuration and status pages within the CTM-MAX user interface.

CTM-MAX Main Page

The first page displays the current CTM-MAX network settings and readings from the on-board GPS receiver

Basic Information

Site name: When set, this field will display the name or location entered under the general system setup page.

Date: Displays the current date when CTM-MAX is connected to the GPS antenna, and has proper GPS lock.

Time: Displays corrected time when CTM-MAX is connected to the GPS antenna, and has proper GPS lock. Time correction can be adjusted to display current time in any time zone from General System Setup page.

Alert: Displays current state of alarm for quick reference.

MAC Address: Displays MAC address of CTM-MAX. Address is permanent, and cannot be altered or changed by the user.

Flash Memory: Upon startup, the CTM-MAX will perform a checksum of the primary memory location containing the user interface and operating files. In the event that memory location “A” is corrupt, the CTM-MAX will boot up using location “B” and display a failed checksum for location “A”. If both memory banks have been corrupted, the CTM-MAX will boot up in Flash Loader mode. In the event of a simultaneous failure of both memory banks contact Last Mile Gear Technical Support at +1(866) 230-9174 or support@lastmilegear.com.

Password Set: Displays current state of password security. Password system OFF is default, with no password set. Password security can be enabled by entering the desired code in the Change Password page. Once set, this file will display CTM-MAX Password lock is ON.

Interface Version: Shows current version of web interface operating software.

Control CPU: Shows current version of CPU software load.

Flash Loader Version: Shows current version of firmware upload software.

Hardware Version: Shows current version of CTM-MAX circuit board.

GPS Version: Shows current version of the GPS receiver module and any extra enabled GPS options.

Network & E-mail Configuration

IP Address: Displays the current IP address assigned to the CTM-MAX. The user can change the IP in the Network Setup page. Default IP setting is 169.254.1.1.

Subnet Mask: Displays the current subnet mask set in the CTM-MAX. The user can change this parameter in the Network Setup page. Default setting is 255.255.255.0.

Gateway: Displays the current gateway IP address set in the CTM-MAX. The user can change this address in the Network Setup page. Default gateway IP setting is 169.254.0.0.

DNS1: Displays the current primary DNS address set in the CTM-MAX. The user can change the address in the Network Setup page. Default DNS setting is 0.0.0.0.

DNS2: Displays the current secondary DNS address set in the CTM-MAX. The user can change the address in the Network Setup page. Default DNS setting is 0.0.0.0.

Network & E-mail Configuration - Continued

SNMP Target: Displays the current SNMP target address and port number set in the CTM-MAX. The user can change the address in the Network Setup page. Default setting is 0.0.0.0:162.

SNMP Community Str: Displays the current SNMP community string set in the CTM-MAX. The user can change this setting in the Network Setup page. Default community string is public.

SMTP Port: Displays the current SMTP port set in the CTM-MAX. The user can change the port number in the Network Setup page. Default port number is 25.

From Email: The current email address in which CTM-MAX alerts will be sent from.

Send To 1: Primary email address for email alert recipient. All alarms and settings changes will have an email generated and sent to this Email address. The user can change this setting in the Network Setup page.

Send To 2: Secondary email address for email alert recipient. All alarms and settings changes will have an email generated and sent to this Email address when entered. Changes for this setting can be made in the Network Setup page.

GPS Receiver Status & Environment

Timing: Here the status of the GPS timing pulse will be displayed. If the antenna is tracking more than 3 satellites, the CTM-MAX will display FIX. When the GPS receiver can see WAAS enabled satellites, the CTM-MAX will display WAAS LOCK in this location. If no satellites can be seen by the receiver, NO-FIX will be displayed.

Antenna Power: Displays the status of the antenna. The antenna must be connected prior to the CTM-MAX being powered up. Otherwise the CTM-MAX will not recognize the antenna.

SATS: Displays the number of satellites the GPS receiver can currently see. At least 6 satellites must be visible to the CTM-MAX for proper GPS timing. However, after 15 minutes of solid time and position fix, the number of satellites in view can drop down to 1 and timing will still be maintained.

Sig S/N (dB): This field displays the current GPS signal to noise level in dB. Antenna S/N noise floor needs to be about 35db in order to locate satellites. The number you see displayed on the web page is an averaged for different 4 satellites that the GPS is using for mathematical calculations. Ideally you want is to see 6 to 8 satellites being tracked. The S/N number will drop off dramatically, suddenly, when the cable gets too long, but is more an indicator of spectrum noise around the antenna. You should see the S/N in the 45 to 50db range, about 55 is max. If you have low S/N and a reasonable-length cable (and a working antenna) then the problem is either a bad cable joint or too much noise in the GPS spectrum (around 1.5GHz). You may also experience some rain fade issues but this is generally limited to instances of the most extreme precipitation. Water in the antenna cable will rapidly kill the GPS signal also. As you also found out, the antenna has to have a clear view of the sky, as much as possible.

Latitude: Displays current latitude position of CTM-MAX gathered from the GPS receiver. You must have visibility of at least 4 satellites before this field will show actual coordinates.

Longitude: Displays current longitude position of CTM-MAX gathered from the GPS receiver. You must have visibility of at least 4 satellites before this field will show actual coordinates.

Altitude: Displays current altitude of CTM-MAX. You will need more than 3 satellites before this field will show the actual elevation. Units of measurement can be changed from the default Metric units to standard in the General System Settings page.

Time Zone: Displays current time zone in relation to GMT. User can change offset in General System Settings page.

Temperature: Displays current temperature inside the CTM-MAX case. Normal operating temperatures may vary depending on environment and installation. Temperature display units are adjustable from Celsius (default), to Fahrenheit in the General System Settings page.

Primary Volts: Displays current voltage on primary power port. Normal operating voltage is approximately 24VDC. In the event that the port has been shorted out, this field will display an OVER CURRENT alarm. The CTM-MAX will automatically switch to the secondary power port until the short has been removed.

Secondary Volts: Displays current voltage on secondary power port. Normal operating voltage is approximately 24VDC. In the event that the port has been shorted out, this field will display an OVER CURRENT alarm.

Logic Volts: Displays current voltage powering memory and processor circuits within the CTM-MAX, and should read approximately 5VDC.

CTM-MAX Sync Pulse Configuration

CTM-MAX Power & Temperature: Here you will find the current voltage readings for both the primary and secondary power supplies as well as the logic power for the onboard electronics.

Primary Volts: Displays current voltage on primary power port. Normal operating voltage is approximately 24VDC. In the event that the port has been shorted out, this field will display an OVER CURRENT alarm. The CTM-MAX will automatically switch to the secondary power port until the short has been removed.

Secondary Volts: Displays current voltage on secondary power port. Normal operating voltage is approximately 24VDC. In the event that the port has been shorted out, this field will display an OVER CURRENT alarm.

Logic Volts: Displays current voltage powering memory and processor circuits within the CTM-MAX, and should read approximately 5VDC

Temperature: Displays current temperature inside the CTM-MAX case. Normal operating temperatures may vary depending on environment and installation. User can change temperature display units from Celsius (default), to Fahrenheit in the General System Settings page.

CMAX Sync Pulse Set-Up

Output A / Output B: Enable, Inverted, Low Voltage Pulse (Low Voltage Pulse is for use with equipment that requires 3.3v for the sync pulse on an un-terminated line or <2v on a terminated line.

Antenna Cable Delay Time Compensation: Here you can manually set the time pulse offset from GPS or select cable type and length in feet. This section must be properly completed to ensure precise timing between sectors when deploying at multiple sites.

Align Sync Pulse Now: This feature manually sets the sync pulse back in line with the GPS Timing. Should the CTM-Max lose GPS sync and run on the back-up oscillator it will eventually drift from true GPS time. When GPS is restored the CTM-Max will gradually adjust the timing pulse back to alignment. Depending on the severity of the correction required it could take several hours. This feature will bypass the slow steering mechanism BUT the attached equipment will experience a jump in the timing pulse.

General System Configuration

Site Name: Enter the name you wish to associate with this CTM-MAX module. This name will be given when alerts are sent via email. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

UTC Offset Hours: You can correct the time displayed on the status screen and the time stamp on alerts which are sent via email. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Enable WAAS/EGNOS Correction for GPS Receiver: Here you can enable/disable the WAAS/EGNOS satellite correction feature. Users outside WAAS/EGNOS coverage should disable this feature to ensure proper GPS satellite tracking.

Enable Metric Units Display: Here you can change the measurement units from Metric (default) to standard. This affects both temperature and elevation readings on the status page. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Adjust for Daylight Savings Time Automatically: Turn this option on for automatic DST adjustment of displayed times for the Americas and most EC time jurisdictions. If the unit is used in the southern hemisphere or in areas not ordinarily covered by the standard DST correction formulas, then the unit can be adjusted manually by leaving this option OFF and manually entering the desired offset from UTC in the UTC Offset Hours box.

NOTE: *The UTC offset hours entered would be for your standard-time zone if using the Auto DST option.*

Network Set-Up

IP Address: Set the IP address for the CTM-MAX Network port. The default setting for this field is 169.254.1.1. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Subnet Mask: Set the subnet mask for the CTM-MAX Network port. The default setting for this field is 255.255.255.0. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Gateway: Set the gateway IP address for the CTM-MAX Network port. The default setting for this field is 169.254.0.0. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

DNS 1: Set the primary DNS IP address for the CTM-MAX Network port. The default setting for this field is 0.0.0.0. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Network Setup - continued

DNS 2: Set the secondary DNS IP address for the CTM-MAX Network port. The default setting for this field is 0.0.0.0. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

SNMP Target: Set the SNMP Target address and port number for the CTM-MAX Network port. The default setting for this field is 0.0.0.0:162. When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

SNMP Community STR: Set the SNMP community string for the CTM-MAX Network port. The default setting for this field is "public". When finished making changes, press the Update Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Requested Connection Speed: Here you can manually set the Ethernet negotiation speed for the Network port on the CTM-MAX.

E-mail Configuration

SMTP Name: Enter the SMTP name for you mail server. The name set in this field will enable your CTM-MAX to send alerts via email. When finished making changes, press the Update Email Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Port Number: This field defaults to Port 25. Unless otherwise specified by your Network Administrator this can remain unchanged. When finished making changes, press the Update Email Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

To 1 Address: Enter the primary email address that you wish alerts to be sent to. When finished making changes, press the Update Email Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

To 2 Address: Enter the secondary email address that you wish alerts to be sent to. When finished making changes, press the Update Email Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

From Address: Enter the email address you wish to have alert Email messages sent from. This email address will appear as the sender address in the recipient's Inbox. When finished making changes, press the Update Email Setup button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button.

Send Test E-mail

Once you have finished configuring the Email Setup page you can use the Send Test Email feature to test your configuration. This button will sent a blank email to both the primary and secondary Email Addresses saved in the E-Mail Setup page.

Change Password

Enter any password, caps sensitive that you wish to use to restrict access to the CTM-MAX web interface. After a user initiates a session by entering the correct password, there is a 5 minute time out. When there has been no activity on the web interface for 5 minutes you will be asked to re-enter the password. Only one session can be initiated at a time without being asked to re-enter the password when changing pages. When finished making changes, press the Submit button at the bottom of the window to save changes. You can reset the fields that have unsaved changes by pressing the Reset button. To turn off password protection, type "No Password" (***This is Case Sensitive***) as the password. This will effectively remove any previously saved password.

View Log

Here you can view the log entries by Date/Time stamp. The newest entries are now at the top of the page to make it easier to find recent activity. You can also send the log file via email to the primary and secondary addresses listed on the E-mail Set-up page.

Error Codes: Generally speaking, numbers below 6 are bad, numbers higher than 6 are error condition re-sets (fault has been cleared).

Master Error Codes

0	Network Connection Lost	9	Test Message
1	Primary Power Lost	10	Primary Power Restored
2	Secondary Power Lost	20	Secondary Power Restored
3	GPS Trouble	30	GPS Time Lock Restored
4	Over Temperature Error	40	Temperature Within Limits
5	Oscillator Error	50	Oscillator Error Resolved
6	Log-In Failure	60	Log-In OK
7	Settings Change	80	Reset Complete
8	Reset	99	Ethernet Communications Restored

Update Firmware

The Update Firmware button is used to change active firmware memory locations or load new firmware to the CTM-MAX.

Change Active Firmware: Use this button to change the active CTM-MAX firmware package. Radio operation will be unaffected as long as the CPU versions between the two packages remain the same. Press the Upload Firmware File button to bring up the Flash Loader page which will display the current firmware versions in each memory location. Once in the Flash Loader page you can go back to the main page by selecting the memory bank you wish to boot to, then press the Go to Selected CTM-MAX Main Web Page button.

Upload Firmware File: When pressed, the CTM-MAX will reboot the network port and bring up the Flash Loader page. Here you can load the latest revision of the CTM-MAX firmware. Depending on your browser settings, you may need to refresh the page to display the Flash Loader page.

To Update your CTM-MAX's Firmware:

1. Use the browse button to locate the ".hex" file.
2. Click on the Update button to begin the upgrade. The flash loader will automatically update the inactive memory bank. The active memory bank is indicated by the green dot next to bank A or B at the bottom of the page.
3. Do not interrupt the upgrade process once the file transfer has begun! DO NOT hit your browser's back STOP or BACK button during file upload!
4. Upon reboot, the CTM-MAX will boot to the memory bank that was just upgraded if successful. REFRESH the flash loader page at the currently set IP address to display the main page. In case the process was NOT successful, the CTM-MAX will reboot using software in the OTHER memory bank, if possible. As a last resort, the CTM-MAX will reboot back to the flash loader page.

Because the Flash Loader software is unable to do anything except, load the flash memory, the front panel lamps will not be operational while the CTM-MAX is in flash loader mode. They will be in whatever state they were in when the system rebooted into flash loader mode. Likewise for the GPS and Control CPU status.

There's no logging, no status updates, no monitoring of the GPS timing to handle backup timing, etc. The power supply & circuit breaker system will still work, as these operate on their own, but these events will not be logged. The Timing pulse, power supply system, and the backup oscillator system will still work, but may drift quite a bit if the GPS goes down while in flash loader mode.

It is still best to do flash loader operations during non-peak traffic load times in case something goes wrong. Users should ONLY use the flash loader when absolutely necessary. Its also not a good idea to enter flash-loader mode and leave it there for long periods of time in case the GPS goes down while in flash loader mode. Radio operation will not be affected as long as the new firmware has the same CPU version as the current firmware revision.

Please Note: The Ethernet connection has to be available for the CTM-MAX to initialize and start managing the rest of the CTM-MAX unit, this feature makes it work with a slower Cisco router.

Cyclone Timing Module Specifications

CTM-MAX Unit		GPS Receiver	
Primary Power Input Voltage Range (Operation)	95 ~ 265 VAC	Position Deviation <i>(Typical per Local conditions)</i>	< 3 ft.
Maximum Voltage Applied to Either Power Port	±180 VDC / 120	Timing Deviation <i>(Typical per Local conditions)</i>	< 1500 nSec
Quiescent CTM-MAX Power	15 Watts	Antenna Drive Voltage	5 VDC
Maximum Operating Temperature	140° F	Time to First Fix <i>(Typical Cold Start)</i>	< 1 Minute
Minimum Operating Temperature	-40° F	Time to First Fix <i>(Typical Warm Start)</i>	< 10 Seconds
Sync Pulse Drift (Backup)	1 - 10 ppm <i>(Depending on rate of temperature change)</i>	WAAS/EGNOS Capability <i>(Increase Accuracy)</i>	Yes
Mechanical			
Dimensions		19" x 11" x 2"	
Weight		7 lbs.	

1. When doing a "Blowout Reset" on the CTM-MAX, hold the button in to 10 seconds to just reset the IP address, hold in 30 sec to reset everything. IF THE ETHERNET cable is connected, you'll see the Ethernet connection light wink off when the button is released. You can still do the reset button thing without a cable connected, but you won't see a light flash. The system isn't able to flash any other lights during a reset-button hold-in procedure.
2. Log entry times are captured at the time the log entry is made, which can be up to three seconds later than when the event really occurred. The reason is when trouble strikes, the system re-reads the information 2 or 3 times to make sure it wasn't a freak event, then makes the log entry. The CTM-MAX does a status check on most of the sub-systems about once per second.
3. If you briefly disconnect the Ethernet cable then plug it back in, you can get an "Ethernet Connection Restored" entry without a corresponding "Connection Lost" signal. This is by design and it shows brief disconnects of 1 to 2.5 seconds. A "Connection Lost" log entry is entered if the connection was lost for more than 2.5 seconds. If the connection is lost for less than 1 second then the CTM-MAX should handle this without flagging an error, so if the router is doing housekeeping you won't get repeated error flags.
4. Due to the time delay for processing GPS messages and handling web page requests, the displayed time on the web page may be up to 2 seconds late.
5. You can't start the CTM-MAX without having the Ethernet cable connected. In order to handle slow Cisco routers, the CTM-MAX will wait until it has a solid connection from the router, up to 50 seconds, before starting its initializer routine. If a connection is not made within that time, it will reset itself and start looking for a connection again. The reason for this is so that when the Web Interface stack initializes, it has a stable Ethernet connection to get all its marbles lined up just right for the connection type.
6. It takes about 20 seconds of stable-time lock for the Web interface to release a "Reset Complete" log entry on reset.
7. On Reset, the system will force a warm-start reset of the GPS software, and this will cause a momentary loss of time lock. You'll see a GPS Sig Loss, then a GPS OK log entry in a row in the logs, this is normal. The sync pulses to the attached equipment are unaffected, though – they are just being steered back into GPS time lock.



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