

3000 Series TS-1 Firmware v3.6

Peek Traffic is pleased to announce the release of Version 3.6 of the TS-1 firmware for the 3000 Series Traffic Controllers. The primary purpose of this release is to improve communications reliability, but it also adds a couple of new overlap modes, improves the onscreen interface, and corrects a few issues reported in previous versions of the firmware.

Product.....TS-1 Firmware for 3000 and 3000E Traffic Controllers
VersionVersion 3.6
Release Date 11/23/04

Importance of This Update

This is an important update for TS-1 3000 and 3000E Traffic Signal Controllers. If this update is performed on controllers used with the CLMATS™ central software system, CLMATS must be updated to version 2.4 (or higher) as well, to gain access to all of the new features.

Product Compatibility

This firmware is designated part number 8216B Version 3.6, and is released for use in all field and production 3000 and 3000E Traffic Controllers that have been designated NEMA TS-1 units. It should not be installed in units that communicate via Protocol-90 or NTCIP. It can be used to update earlier versions of series 8216B firmware and also series 5074 firmware.

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Note If this update is used to replace 5074 firmware, the controller will no longer be compatible with the Smartways software. Using this to update from the 5074 firmware also requires that all Special and Restricted Menu settings be cleared.

This release requires version 2.4 or higher of **CLMATS**. The firmware should not be used with versions of CLMATS older than v2.4, and is not compatible with **Smartways**®.

This version of firmware does not support 3000E operations with a 3800EL Master controller in 7 bit mode.

Delivery Method

This firmware is typically delivered to the controller as two binary files that are burned to the controller's EPROM memory chips. When updating the EPROM chips that will be placed into your 3000 or 3000E controller, the proper checksums for the two binary files are listed in **Table 1**.

Table 1 – Checksums for v3.6 TS-1 3000 and 3000E firmware (Build 336)

EPROM	Checksum value (hex)
0	9378
1	2CDB

Upgrade Process

There are two steps to the upgrade process. First, load the new firmware into the controller and verify its operation. After the firmware update, go to the next section in these Release Notes to update the modem setup string. (This latter step is only necessary if an external modem is used with your 3000 series controller.)

Installing Updated Firmware to EPROMS

To upgrade an EPROM-equipped 3000 or 3000E Traffic Controller in the field, follow these instructions:

1. If you ordered updated EPROMS from Peek rather than just the firmware files, skip down to step 6.
2. Locate the following items in order to burn the updated firmware to EPROMS:
 - Two 4MB EPROMs (28 pin DIP package), these may be recycled out of field units
 - an EPROM burner capable of holding a 4MB EPROM
 - EPROM burning software
 - the two binary files containing the updated 3000E firmware
3. If the EPROMs were used previously, erase them.
4. Insert one of these blank EPROMs into the burner and burn the firmware file named **b336-0.bin** onto it. Label it '**3.6 EPROM 0**'.
5. Insert the other blank EPROM into the burner and burn the firmware file named **b336-1.bin** onto it. Label it '**3.6 EPROM 1**'.
6. Observing all safety and other municipal ordinances, place the intersection to be updated into flash.
7. Power down the 3000 Series Traffic Controller.
8. Open the front panel and remove the two EPROMs that are currently installed in the unit. Replace them with your updated versions, being sure to place the properly labeled EPROM in each socket.
9. Restore power to the unit.
10. As the unit powers up, it performs a series of database verification tests. If any of the seven databases in the controller's memory have been corrupted in any way, this test will detect it. If any problems are seen, the unit will display an error screen, as shown in the next figure. Any databases that have problems are listed on this screen. The only way to proceed to a running state is to acknowledge this error screen by pressing the CLEAR button. Any of the controller databases may be seen to be corrupt: Controller, Coordination, Time of Day, Preemption, Option, and Special.

```
Database sections are corrupt!  
  
[Controller] [Coordination]  
  
Press the [CLEAR] key to clear the  
above sections and continue.
```

Figure 1 – Power-on Self Test Error Message

If this window appears, press the CLEAR key to go ahead and start the controller.

11. If any database errors were detected, you will need to load good files into the controller before using the controller to run an intersection. This can be done by choosing to load default databases (MM > 3. Change Data > 8. Utilities > 1. Default Data Load menu,) or you can load a good set of databases from CLMATS, an EPROM card, or by using a Pocket PC handheld device with the Pocket Central utility software loaded.

If there were no database errors detected, proceed to the next step.

12. Press **1** for Dynamic Displays.
13. Press **1** for Controller Func(tions).
14. Examine the Normal Status screen for proper operation and cycling.
15. If everything appears to operating normally, return the intersection to normal operation.*

Updating the Modem Setup String

Significant improvements have been made to the 3000 Series communications processing logic. As a result, a couple of changes should be made to a modem setup string for the controller (if your controller uses an attached modem for communications with CLMATS.)

To change the setup string, you will need to go to the Communications & System Setup Menu (MM > 3. Change Data > 5. Comm/System Setup.) On this menu, select option 2. Comm Setup, and then page down to the third screen. (These Com Setup screens have changed in firmware v3.6, as is described in these release notes on page 5.)

The following changes should be made to the string:

- Auto answer must be OFF. Previously it was ON for 3000 series controllers, but with the new firmware, answering the modem is handled by the controller firmware rather than by the modem. (typically: 'S0=0')
- Error correction should now be set to ON. In the past, we had recommended that it be turned OFF. (The commands are '&M4' for U.S. Robotics modems and '\N2' for LPM modems.)

* In the past, customers have also been told to clear any central overrides that may be active in the controller whenever attempting to create a 'Healthy Controller' situation. If overrides are an issue, the clearance process has changed, as described on page 9.

Enhancements Added in This Firmware Release

Communications System Improvements

The 3000 Series communications system itself, as well as the interface screens used to configure it, have been modified in several ways to improve operation and ease-of-use.

More Useful Communications Status Screen

In previous versions of the firmware, the 3000 series controllers had two Comm status screens that could be accessed under item 10 (**SHIFT-0**) on the Dynamic Display menu. These Comm status screens were designed to display the status of communications with an M3000 Series Master Controller. But the ports of the 3000 series controller can be used with many other devices than just a master controller. Because of this, the Comm status screens have been made more general so they can display simple communications status parameters for either Port 2 or Port 3. Also, the labeling on these screens has been made more easy to understand. Previously, the top screen in this area was called the ‘Controller-Master Comm Dynamics’ screen. It is now called the MIZBAT Dynamic Status screen, and it shows what MIZBAT commands have just been sent and received by the controller. It also shows a timeout timer that is used whenever an **sp** or **mp** command is received. (The **sp** and **mp** commands are polling requests from central.)

```

MIZBAT Dynamic Status

Last command received   : sp
Last command transmitted : sq
Master polling timer    : 59.1

Press ONE to remove circuit overrides
from central: No overrides active
  
```

Figure 2 – New Dynamic Comm Status screen

If the polling timer reaches zero, the screen will display “Timeout for the Master polling timer” and the master override will automatically deactivate in the controller.

This screen can also be used to manually clear circuit overrides received from central. If you want to clear an override locally, press the ‘1’ key on this screen. (This functionality has not changed from earlier versions of the firmware.)

Previously, if one paged down from the old Controller-Master Comm Dynamics screen you would see a very cryptic Communications Debug Dynamic Data screen. This debug screen has been replaced with a pair of Comm Port Status screens, as shown here:

```

Status Comm Port 2

CD      : No           Modem : Answering
CTS     : Yes          Timer  : 0
DTR     : Yes          Unused: 2
TXBD    : 0
RXBD    : 4
  
```

Figure 3 – Comm Port Status screen (showing the status of Port 2)

Use the PGDN key to switch to the Port 3 version of this status screen. These screens cannot be edited in any way; they are simply there to provide feedback on the status of the two comm ports on the 3000E.

The top three parameters on the left side of the screen show the communication signal line states. The bottom two (TXBD and RXBD) are the Transmit Buffer Descriptor (which should always be 0) and the Receive Buffer Descriptor (which goes from 0 to 7 and then wraps back to 0.)

Modem – This line displays a status message showing the current state of the device (assumed to be a modem) connected to the port. The possible messages that can show up here are listed in **Table 2**.

Table 2 – Modem Status Messages

Message	Notes
DTR LOW/DTR HIGH	This switching tells the modem attached to the port to reset. After these changes happen, the controller sends the modem initialization string that you have specified.
INITIALIZING	After the initialization string has been sent, but before the modem is back up and operating under the new settings.
Waiting	This is the message displayed when the modem is up and running, and the controller is waiting for an incoming call.
Answering	Displayed when an incoming call has been detected, but normal communications haven't been established yet.
Connected	Displayed after good communications have been established.
Dialing Ph#1	Displayed when the modem is calling out, using the primary phone number.
Dialing Ph#2	If the Alternate Phone Number circuit is active (TOD circuit 121:'PH2') and a Secondary phone number has been entered in the Phone settings screen, then this number will be tried, but only after 'Dialing Ph#1' fails. When this event occurs, the Modem status line will display this message.
No modem	This message appears when no modem is attached to the port, or the modem is off.

Timer – This countdown timer shows the timeout count when an incoming or outgoing call is attempted.

Unused – This shows the number of 'trash' characters that have been detected in the communications stream.

More Intuitive Comm Port Setup Screens

The Comm Port Setup screens have been reorganized so the parameters are easier to understand and use. Previously, when one entered the Comm Setup Screens from the Communications & System Setup menu (MM > 3 > 5 > 2), the controller presented four setup screens (accessible by paging down.) The first of these was a screen where the Master Port, Monitor Port, and Central Port were assigned. This screen has been removed. Now, the controller goes straight to the Comm Port 2 Setup screen:

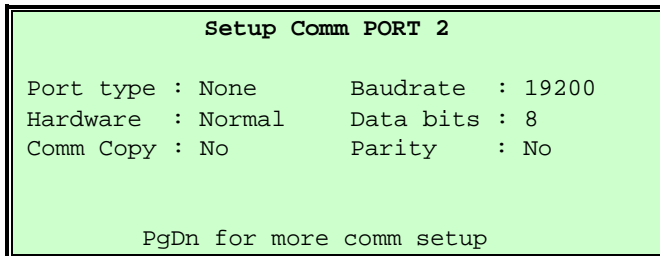


Figure 4 – Comm Port 2 Setup screen

Whenever Port 2 on the front of the 3000 Series controller is accessed, these settings are used. Use the arrow keys to navigate, and the Y/N key to change the value for a parameter.

Port type – This setting is only used by the controller when it is set to 'Monitor', indicating that an intersection monitor is connected via this port. Note that this setting also allows a monitor to be connected via a modem (if anyone would want to do so.)

Baudrate – Sets the data transfer speed for this port. The firmware will accept values of : 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, and 115200 baud. (But the selected rate can only be achieved if the device attached to this port can also communicate at this speed.) This parameter is not displayed if Hardware is set to Ethernet.

Comm Copy – This setting replaces the parameter in the Closed Loop Master/ID screen called 'Allow Comm Transfer Between Ports 2&3'. What this command does is tell the controller to echo the input on this port to the other port. (This works for data input to either port.) Although this setting appears on both the Port 2 and Port 3 screens, there is only a single value for this parameter in the database. So setting this value to Y or N on one port automatically sets it to the same value on the other port.

Hardware – This tells the controller what type of hardware is attached to this port: It can be set to either an ‘AT Modem’ (i.e. a ‘Hayes compatible’ modem), ‘Normal’ or ‘Ethernet’. (Port 2 does not have the ‘Ethernet’ option.)

Table 3 – Proper ‘Hardware’ settings for various Port 2 and 3 devices

Port card or hardware	Proper ‘Hardware’ Setting
RS232 (direct connect)	Normal
RS232 (with external modem)	AT Modem
Serial/Ethernet combo card	Ethernet
Fiber	Normal
FSK Modem	Normal

Data bits – The number of bits per byte. (Can be either 7 or 8.) This parameter is not displayed if Hardware is set to Ethernet.

Parity – The type of parity check used on bytes to verify that no bit-level changes have occurred during transmission. (Even, Odd, or No parity check). This parameter is not displayed if Hardware is set to Ethernet.

Pressing **PGDN** from this screen will allow you to set the same parameters for Comm Port 3.

The Setup Comm Port 3 screen is identical to the Port 2 screen, except that there is an additional Hardware setting: Ethernet. If Hardware is set to Ethernet, the right column parameters are hidden. (Ethernet forces these values to their fixed Ethernet values: 115200, 8, No.)

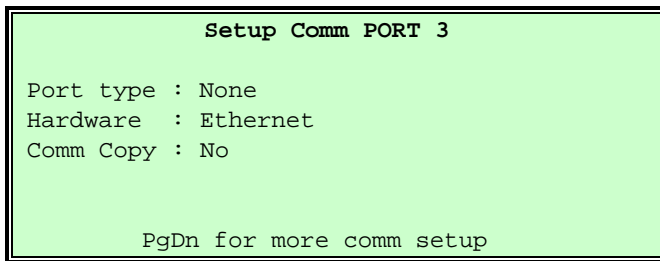
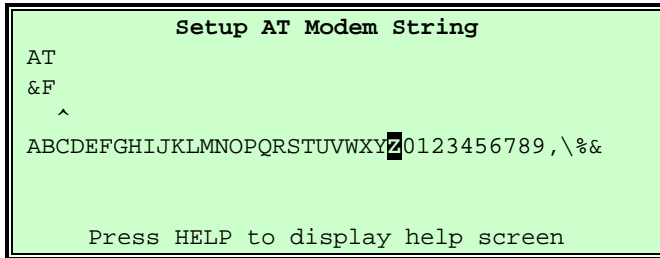


Figure 5 – Comm Port 3 Setup screen with Hardware set to “Ethernet”

Paging down yet again will take you to the screen where the modem’s ‘AT’ setup string is entered. In firmware v3.6, this screen has been modified to make it easier to enter the desired string. (Note that the firmware automatically puts an ‘AT’ at the beginning of this string, so you do not need to enter these letters.)



The caret symbol (^) shows where the next character will be added on the third line. To add a character, move the highlight cursor (within the alphabet listing) to the desired letter, using the left and right arrow keys, and press **ENTER**.

Removed Comm Transfer from the Closed Loop ID Screen

The Closed Loop Master/ID screen (option 1 on the Communications & System Setup Menu) no longer has the ‘Allow Comm Transfer Between Ports 2&3’ parameter settings. The reason for this is that these parameters were not related to the closed loop master ID. This setting is now available as the Comm Copy parameter on the Comm Port Setup screens.

Removed Printer Comm Port Settings

A confusing aspect of communications setup in the 3000 Series controllers prior to the version 3.6 firmware was the fact that comm settings were stored in multiple locations, depending on the intended use. The best example of this were the communications settings on the Utilities > Printer Menu, where option 1 allowed one to set communications settings for a serial printer attached to Ports 2 or 3. This screen has been removed. Although the option is still there, selecting it now shows a help window that explains the change.

Instead, a printer will now use the communications settings that are assigned to whichever port it is plugged into, as configured on the normal Comm Setup screen. (Main Menu > 3 > 5 > 2).

Unit-to-Unit Transfer Menu Removed

This set of commands, seldom used by operators of the 3000 Series controllers, was removed from the interface for a couple of reasons:

- To simplify the interface
- To free up system resources for other tasks
- There are other ways to copy controller databases between units, namely: EEPROM cards, programmable flash memory and utilities, and via CLMATS
- 3000 series controllers rarely sit next to one another in the field

The Transfer menu was option 2 on the Utilities menu. (Main menu > 3 > 8).

Additional New Features Added in v3.6

Early Preemption Output

This per-run option applies only to preemption outputs associated with Interval 1. When **Early Preempt Output = Y**, all outputs associated with Interval 1 will turn ON as soon as the controller begins clearing the active phases. When **Early Preempt Output = N**, the outputs won't activate until the controller is actually *in* the Interval 1 phases.

New Ped Overlap Mode

Each Ped Overlap can now be set to operate in one of three modes. (The first two were present in previous firmware releases, the third one is new to v3.6.) To illustrate how these three modes work, we use Ped Overlap A with parent phases 2 and 4 in the examples below.

Ped Overlap Mode 1:

In this mode, the Ped Overlap will advance to Ped Clearance when cycling from one phase to another.

2 Walk	2 Ped Clear	2Y	2R	4 Walk	4 Ped Clear
POL A Walk	POL A Ped Clear	DWK		POL A Walk	POL A Ped Clear

Ped Overlap Mode 2:

In this mode, the Ped Overlap will remain in Walk when cycling between parent phases, and advance to Ped Clearance when cycling to a non-parent phase.

2 Walk	2 Ped Clear	2Y	2R	4 Walk	4 Ped Clear
POL A Walk				POL A Ped Clear	

Ped Overlap Mode 3:

In this mode, the Ped Overlap will remain in Ped Clearance when cycling between parent phases, and advance to Don't Walk when going to a non-parent phase.

2 Walk	2 Ped Clear	2Y	2R	4 Walk	4 Ped Clear
POL A Walk	POL A Ped Clear				



Note The following reminders may help when using Ped Overlap Modes:

- A Ped Overlap will only provide a walk and ped clearance interval when a ped call exists on a parent phase.
- The Ped Overlap output is not defined by NEMA. Therefore, in TS-1 Mode, I/O Steering is the only way to provide the Ped Overlap field output. In TS-2 Mode, simply program the Ped Overlap to an MMU Channel.

Two New Vehicular Overlap Modes

These two new vehicular overlap modes have been added to the 3000 Series controllers in the v3.6 firmware:

Overlap Mode 7: Minus Walk Overlap Red

Mode 7 operates the same way as the Not Ped Overlap, except that during the Ped Clearance interval of any phases programmed with the "MIN WALK" entry, the Overlap will turn green. Note that the Not Ped Mode 2 Overlap will not turn the Overlap green until the Ped Clearance is finished.

Overlap Mode 8: Minus Walk Overlap Dark

Mode 8 operates in the same manner as Mode 7, except that during the Walk interval of any phases programmed with the "MIN WALK" entry, the Overlap will go dark.

Cleaned Up Power-Up Error Checking

In previous releases of the 3000 series firmware, the configuration databases in the controller were tested every time the system was started using a confusing set of ‘Checksum tests’ and tools in the controller screens that could be used to override they tests if any errors were found. But now, in the version 3.6 release, the firmware simply tests the controller databases upon startup (there are seven of them) and reports immediately if any problems are found. If any problems are discovered, an error screen appears, showing all of the databases where problems were detected. This is what the screen looks like when (for example) three of the databases have errors:

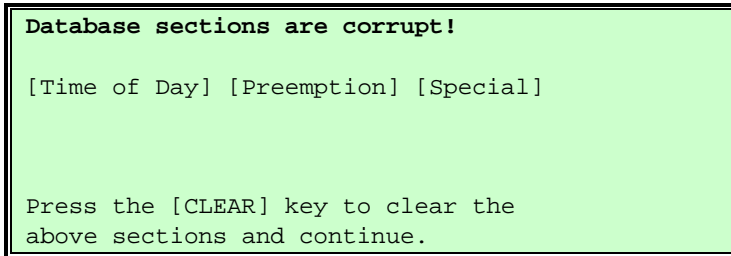


Figure 6 – Power-on Self Test Error Message with 3 database errors detected

Unlike before, when the controller started up even if it did detect a ‘Checksum’ error, and the operator had to look very carefully at the main dynamic status screen to see if there were problems, the new system uses a CRC test (Cyclic Redundancy Check) and it won’t allow you to start the controller unless you acknowledge that you’ve seen the error by pressing the CLEAR key. This also clears the database contents to a blank state. This is judged to be safer than to allow a corrupted database to be used to run an intersection (as was sometimes done in the past.)

After such an error, the controller’s databases should be reset to default, or good databases should be loaded into the controller via CLMATS, an EPROM card, or by using the Pocket Central software on a Pocket PC handheld device.



Note For details about the way that the CRC check is performed in CLMATS and the 3000 series controllers, you can refer to the MIZBAT Protocol Manual, available from Peek Traffic Corporation. (p/n 81-1001)

Two related changes to the interface are in the Dynamic Controller Display screen and the Checksum Status screen. The Status of the controller is still shown on the bottom line of the Dynamic Controller Display screen (MM > 1 > 1), but since checksums are no longer tested, these kinds of errors no longer appear in this location. (Error status is shown upon startup as described above.)

The other item is on the Dynamic Display menu (MM > 1), where the Checksum Status option still appears (Option 9), but it now only shows this message: “NO CHECKSUM FAILURES PRESENT”. The controller no longer allows an operator to reset the checksum calculation so that the controller will run with a faulty database in memory.

Cleaned Up Override Clearance

In previous versions of the controller firmware, the Central Override states could be cleared from the Comm dynamic display screen (MM > 1 > shift-0). However, an effort has been made to remove all data entry and modifications out of the dynamic display screens. These areas are intended to be safe areas where controller status is viewed, but not modified. As a result, the clearance of Central Overrides is now performed elsewhere.

To clear a central override, go to the Coordination Menu and then into the Enhanced Options screens. The exact path is **MM > 3.Change Data > 2.Coordination > 9.Enhanced Options > 1.Operating Options**. This screen has not changed in the version 3.6 firmware update. It still includes a control to clear central overrides. To clear overrides, change the value of **Central Override** to **N**.

Enhancements Included in this Release

The enhancements described in the previous section were triggered by the following ECRs.

Table 4 — Enhancements included in the Version 3.6 TS-1 firmware

Issue	Resolution	Issue ID (ECR#)
Customers have requested an Overlap feature called "Overlap Minus Walk" where a NOT PED overlap would go GREEN when its parent phase is in PCLR. In addition, a related but independent feature was requested to allow the NOT PED Overlap to go dark when the programmed Ped is in walk. When not in walk, it operates as a standard overlap with the "parent phase."	Added logic to allow a NOT PED overlap to go GREEN when its parent phase is in PCLR. Also added logic to turn off the NOT PED overlap RED while its parent phase is servicing the Ped movement. <i>These two operations are independent of one another.</i> These options are enabled by using Overlap modes 7 and 8, respectively.	563
Change to Preemption requested: When the Preemption P.E. Out feature was enabled in the first interval of a preemption run, the P.E. Out output was activated immediately after the arrival of the Preemption Call. The issue is not defined in the NEMA standard, but customers want it to start with the start of the preemption interval, not the clearance interval(s) of the last serviced phase.	An option is added (per Run) entitled "Early PE Out" When enabled for a run, the PE outputs associated with Interval 1 come on as soon as the PE call occurs. When not enabled, the PE outputs associated with Interval 1 come on only when the controller state matches Interval 1 phases/colors. This option is programmed under the Run Enable, Railroad, Input Lock area. It defaults to the disabled state, or in other words, early preemption outputs are NOT used.	584
Customers have requested a Ped Overlap mode which will "carry over" the Ped Clearance state while the controller transitions from one ped overlap parent to another.	Added logic to allow a Ped Overlap to operate in a new mode 3. Mode 3 allows the Ped Clearance state to be held through the transition from one parent to another.	908

Other Issues Addressed in this Release

The following are issues that existed in previous releases of TS-1 Firmware for the 3000 and 3000E Traffic Controllers which have been rectified in Version 3.6:

Table 5 — Issues fixed in this release

Issue	Resolution	Issue ID (ECR#)
Time drift reported in some isolated controllers that were being regularly polled by CLMATS.	The comm system has been redesigned to remove this issue. The time drift problem has been corrected.	130, 537
The Phase Allocation Screen (MM->3->2->6) was displaying incorrect data for Cycle Length. It appeared that, instead of the proper six stand-alone cycles, TS-1 units were collecting data in the TS-2 format (24 cycle/split combinations)	The logic of the phase allocation screen was corrected to display the proper cycle/split times.	404
The Override Flash parameter did not copy correctly when using the Preemption Copy Function found in the Utilities menu.	Added a provision to copy the Override Flash parameter. The Override Flash parameter is stored in a different data structure than the rest of the Y/N parameters.	444
Coordination logic did not always properly compensate for NOT PED overlap operation. The problem occurred when a NOT PED overlap was required to clear in order to service a pedestrian movement during coordination.	Added logic to close PED permissives appropriately.	480
The Preemption Min Ped Clear Entry time was not respected if the PE call was applied during the Walk interval. However, if the PE call came in during Ped Clearance, the operation worked correctly.	The Ped Clear interval was being skipped only when the first interval was a Fixed interval. This problem has been corrected.	521
General problems with 3000E and M3000E communications, particularly via consumer modems. The 3000E was created a great many 'trash' characters that clogged bandwidth when they had to be retransmitted.	The comm system in the 3000E has been completely redesigned and rewritten. This has resulted in dramatic improvements to transmission reliability and in general operation with external modems.	535, 576, 603, 1054
When Monitor Mode was used in CLMATS, the M3000 calling into central usually connected, but the 3000E often failed to connect.	Upon connection with CLMATS, the 3000 series controller now attempts to initiate communications multiple times. In testing, this has demonstrated dramatic improvements in reliability of connecting with central.	545
It was reported that syncing a PC clock against a controller's clock would routinely indicate 1-20 seconds of difference, even though the devices seemed to be synced.	The 3000 Series firmware now has completely new timing code that tremendously improves timing reliability and sync-up.	747

Issue	Resolution	Issue ID (ECR#)
If a phase had non-lock disabled (locking mode) and the phase's max timer finished while a ped was timing, when the phase terminated, a call was left on the phase even though the passage timer was at 0.0. This is counter to the NEMA standard.	This has been fixed. A call is left on the phase only if the passage timer is non-zero when the ring transitions to PREP.	798
A Bus error was seen when using the Transfer from Port 2 to Port 3 option.	This was fixed as part of the new COMM system.	822
Occasionally, BUS ERRORS occurred when paging down from some dynamic screens.	Added logic to prevent out of bounds indexing of the User Interface function pointer arrays.	901
Coord calculations failed to allow coordinated phases when in CNA 'Start of Main Street' mode. The coordinator failed to open the coordinated phase vehicle permissives when using CNA 'Start of Main Street'.	Reset a variable when Coordinated Phases are operating in CNA mode, to prevent Coord Phase permissives from closing prematurely.	944
CVM Instability on start-up-CVM activated, then deactivated momentarily and then reactivated on power up. This caused problems with the MMU, forcing the intersection into Flash.	Rewrote the RTC Sync logic to prevent the disabling of the PLL interrupt for extended periods of time after power up.	945
Not Ped Omits stick during Fully Actuated Coordination. The coordination logic did not properly compensate for NOT PED overlap operation.	Added logic to close Ped permissives appropriately whenever a NOT PED overlap is required to clear in order to service a Ped movement during coordination.	965
A single Dwell preemption interval (often used with Opticom hardware) would not terminate the preemption run if the run was activated during an active Walk.	This problem only appeared when the controller was configured for CNA mode with WRM NOT active. The ped control function was erroneously requiring both CNA and WRM active in order to advance to ped clearance. The logic now only checks for CNA.	1083
On systems that used 3000E controllers coordinated with M3000 master controllers, some customers reported coordination problems after loading firmware v3.4.2.	This was caused by a problem with the Master Cycle Timer on the controller. If Cycle Source is Closed Loop or Time of Day, the Master Cycle Timer is loaded based on the time of day and reference. If Cycle Source is Interconnect, Master Cycle Timer value is derived from the pulses on the offset input.	1105
The controller's screen contrast setting was not being saved when the unit was powered down and back on. This made it hard to see the startup sequence and required resetting the screen contrast value.	The controller now retains the previous screen contrast setting over a restart.	1296, 1306

Additional Guidance on the 3000 and 3000E Traffic Controllers

These are some other sources of information about Peek's 3000 and 3000E Traffic Controllers.

Additional Documentation

These documents provide useful information about 3000 Series controllers and other products often used along with them:

Table 6 – Additional Documentation about 3000 Series traffic controllers

Document	Part Number
<i>3000 Series Operating Manual</i>	8204C
<i>3000 Series TS2 Firmware (8216A) Release Notes</i>	99-332
<i>3000 Series Protocol-90 Firmware (8216F) Release Notes</i>	99-371
<i>Tech note: Modem Setup Instructions for UTC Devices</i>	99-385
<i>CLMATS Installation Manual</i>	81-858
<i>CLMATS Operating Manual</i>	81-883
<i>CLMATS Release Notes</i>	99-275
<i>CLMATS Preemption Management Module Release Notes</i>	99-365
<i>Double Diamond MMU Operating Manual</i>	8314B
<i>M3000 Operating Manual</i>	5928
<i>M3000 Firmware Release Notes</i>	99-329

Additional information is also available at the Peek website: <http://www.peaktrafficinc.com/>.

Technical Support

This information will connect you with Peek Traffic Corporation if you require additional help concerning 3000 and 3000E Traffic Controllers.

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