



beyond  
payment

# **Telium Download User's and Developer's Guide**

**Telium Devices (iSC350, iSC250, iPP350, iPP320)**

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# Revision History

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Manual Revision	Application Revision	Changes
C	1.4.2	<p>2.1 – Creating an EFT Package:</p> <ul style="list-style-type: none"><li>• Rewrite steps to match updated process.</li></ul> <p>4 – Telium Download Application (TDA) Configuration:</p> <ul style="list-style-type: none"><li>• Updated with new TDA menu structure.</li></ul> <p>4.3 – Triggering Downloads From TDA:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>4.3.1 – EFT Downloads:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>4.3.2 – Remote Downloads:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>4.3.3 – TMS Downloads:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>5.5 – Online Request with New EFTL Level 02 Extended Commands:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>A.11 – 47.x – Read N ETFL Records Request Format:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul> <p>A.12 – 48.x – Read N ETFL Records Response Format:</p> <ul style="list-style-type: none"><li>• Added new section.</li></ul>
B	1.3.0	<p>3.2.1 – IBMEFT-Compliant Boot-Time Download:</p> <ul style="list-style-type: none"><li>• Updated process steps.</li></ul> <p>3.2.2 – IBMEFT Emulation Download for Non-IBM ECRs and PCs:</p> <ul style="list-style-type: none"><li>• Updated process steps.</li></ul>
A	n/a	Initial release.

## Notes

# 1. Overview

This document describes the EFT download process used to update financial applications, images, parameters, and other types of data files on Ingenico's Telium PIN pads using Serial, USB-CDC, USB-HID, Tailgate, or Ethernet communication protocols.

## 1.1. The Telium Download Process

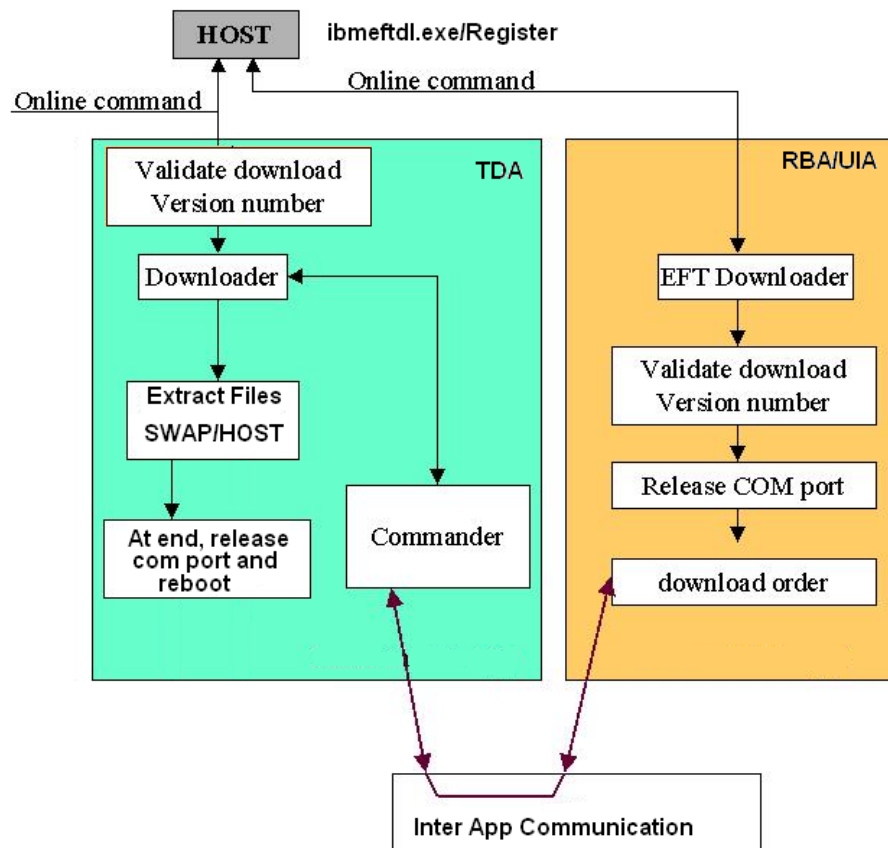


Figure 1 - The Ingenico Telium download process.

Ingenico Telium PIN pads are updated using a download process based on the IBMEFT file transfer protocol originally implemented on IBM Electronic Cash Registers (ECRs) in the early 1980s. This protocol allows the transfer of EFTP files (which contain Ingenico application parameter, prompt, or image files) and EFTL files (which contain Ingenico application and operating system files) from a host system to an Ingenico PIN pad connected using one of the supported communication types.

The download process works in the following manner:

1. User creates EFTP and/or EFTL download packages containing data to be loaded onto the Ingenico PIN pad.

2. 01.x (Online) message pair is exchanged between the Ingenico PIN pad and the host system.
3. If program load and/or parameter load numbers found in Online message are different from those in the PIN pad's memory, the Telium Download Application initiates the download process (otherwise, PIN pad boots up normally).
4. Once downloaded, TDA unpacks the contents of the EFTP and/or EFTL files to the appropriate locations within the PIN pad's memory.
5. After unpacking, TDA reboots the PIN pad.

Except for the steps needed to prepare the download files and load them to the host, the Telium download process is mostly invisible to the user.

## 1.2. Requirements

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In order to load an Ingenico PIN pad with updated content using the Telium Download process, the following items are required:

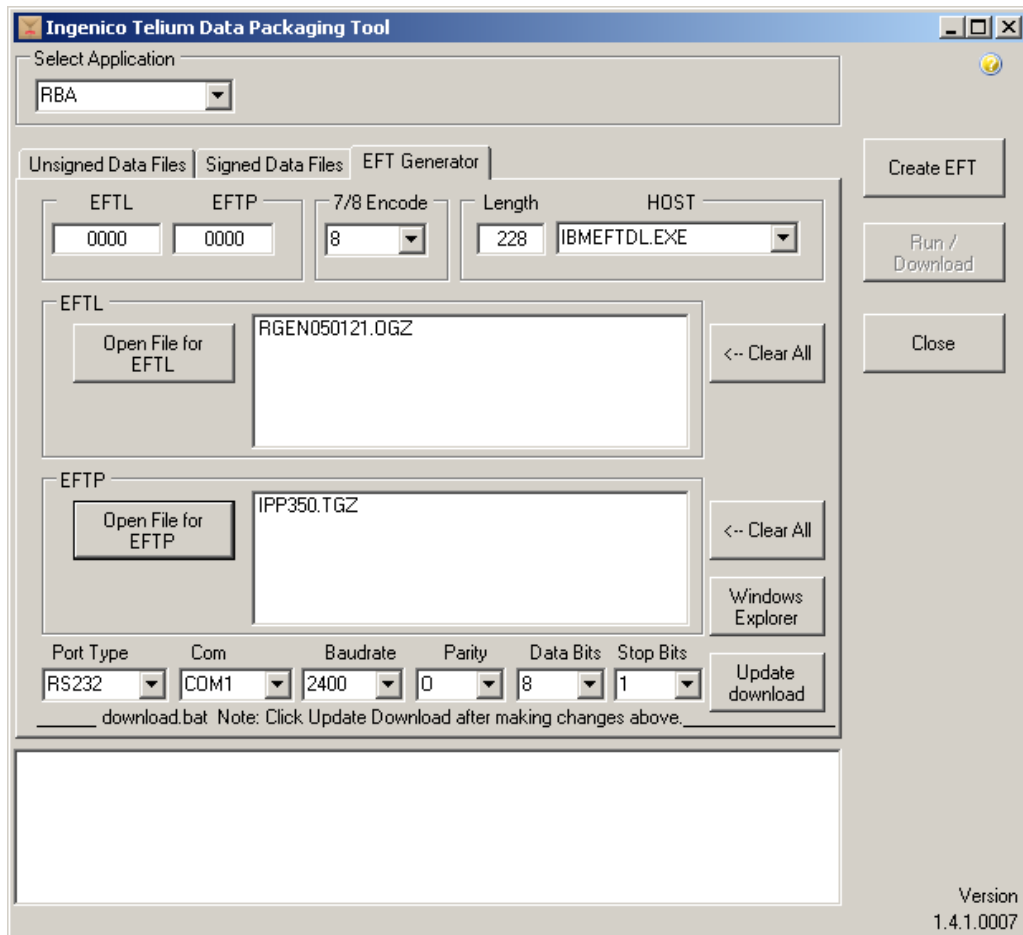
- An Ingenico Telium PIN pad loaded with RBA or UIA v1.30 or higher.
- Ingenico's Telium Tools Suite v1.3.0.1 or above (including Form Designer and the Data Packaging Tool).
- A compatible host system (Electronic Cash Register or PC).
- Any content suitable for loading onto an Ingenico PIN pad, packaged in the EFT format.



## 2. EFT Download File Creation

EFT files containing data to be loaded onto Ingenico Telium PIN pads can be easily created using the EFT Generator tab found in Ingenico's Data Packaging Tool (available with the Telium Tools Suite v1.3.01 and up).


### 2.1. Creating an EFT Package




**Figure 2 - The Data Packaging Tool's EFT Generator tab.**

System administrators and developers can easily create EFT download packages using the Data Packaging Tool's EFT Generator tab by following these steps:

1. Select the Ingenico financial application you wish to package EFT files for from the Select Application drop-down.
2. Select EFTL and/or EFTP files for packaging by clicking the Open File for EFTL and/or Open File for EFTP buttons and browsing to the desired file(s).
3. Type the desired EFTL and EFTP load version numbers in the corresponding fields.

 In order to trigger a download, the specified load version numbers must be different from those found in the PIN pad's memory.

4. Select a 7/8 Encode setting from the drop-down.

 The 7/8 Encode setting must match the Data Bits setting when RS232 is selected as the Port Type for the EFT package to work correctly.

5. Type in the desired Length setting depending on the comm. type you will be using for EFT downloads:
  - a. For serial / USB CDC, maximum allowable length value is 1024
  - b. For tailgate, maximum allowable length value is 230.
  - c. For USB HID / Ethernet, maximum allowable length value is 10240.
6. Select the Host setting that corresponds to the host that will be used to load the PIN pad:
  - **IBMEFTDL.EXE** – pick this setting for EFT downloads using a PC-based host or non-IBM compliant register.
  - **IBM Register** – pick this setting for EFT downloads using an IBM register.
7. Select the communication method from the Port Type drop-down menu, and then specify the related communication settings listed to the right of the drop-down.
8. Finally, click the Create EFT button to generate an EFT download package at `c:\Documents and Settings\All Users\Ingenico\Data Packaging Tool\EFT`.

Once the download package has been generated, the folder is displayed in an Explorer window.

For detailed information on what each setting's allowable values and their impact on EFT file creation, see the EFT Generator section in the Data Packaging Tool / Telium Tools documentation.

## 2.2. EFT Download Package Contents

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The Ingenico Data Packaging Tool's EFT Generator places EFT download packages at the following path:

`c:\Documents and Settings\All Users\Ingenico\Data Packaging Tool\EFT`

Valid EFT download packages contain the following types of files:

- **download.bat** – used to launch the EFT download process from a host PC or non-IBM ECR. Not required for downloads using an IBM ECR.
- **EFTLXXXX** – EFTL files contain application load files and other types of binary files for loading onto Ingenico Telium PIN pads.
- **EFTPXXXX** – EFTP files contain Ingenico financial application parameter files for loading onto Ingenico Telium PIN pads.

- **ibmeftdl.exe** or **ibmeftdl\_eth.exe** – these files consist of PC-based emulations of the IBMEFT download mechanism implemented on electronic cash registers. They allow users to simulate a cash register environment on a host PC in order to trigger PIN pad application and parameter downloads.



*The EFT emulation-based download process uses IBMEFTDL.exe and IBMEFTDL\_ETH.exe version 3.25.*

## Notes

## 3. EFT Download Process

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### 3.1. Loading the EFT Package

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#### 3.1.1. To an IBM ECR

Consult your IBM ECR's documentation for information on loading EFT packages to the register's controller.


#### 3.1.2. To an NCR-based ECR

Consult your NCR-based ECR's documentation for information on loading EFT packages to the register's controller.

#### 3.1.3. To a PC or Windows-based ECR

EFT download packages can be loaded to any path on a host PC, provided that the EFT files, download.bat file, and IBMEFTDL.EXE (or IBMEFTDL\_ETH.EXE) are all contained within the same folder.

When executed, the download.bat file will attempt to load all files needed for the EFT download from the folder where it resides.

 *The Telium Download process is not supported for Linux systems.*

### 3.2. Triggering the EFT Download

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The two methods for initiating an EFT package download on an Ingenico PIN pad are:

- IBMEFT-compliant boot-time download (for IBM ECRs).
- IBMEFT emulation download (for non-IBM ECRs and PCs).

Both of these mechanisms are discussed in more detail below.

#### 3.2.1. IBMEFT-Compliant Boot-Time Download

The IBMEFT download protocol was originally implemented in IBM Electronic Cash Registers (ECRs) in the early 1980s. Both EFTL (i.e., code load files) and EFTP (i.e., parameter load files) can be downloaded using the IBMEFT protocol command set.

The boot-time download process works as follows:

1. An Ingenico PIN pad connected to the IBM ECR containing the EFT download package is powered up.
2. The PIN pad sends a 01.x message to the IBM ECR.
3. The IBM ECR compares the application load and parameter load numbers from the PIN pad with EFT package found on the register. If the package on the register contains a different application load and/or parameter load version number, the download process is initiated.

4. PIN pad control is turned over to TDA, which displays a screen showing the download's progress.
5. Once the EFT package has been downloaded, the PIN pad loads the EFT package by moving each of the compressed files it contains to the correct path on the PIN pad's memory:
  - a. \*.TGZ → HOST
  - b. \*.OGZ → SWAP
  - c. \*.PGZ → PIN pad's secure directory
  - d. \*.MP4, \*.DAT, \*.K3Z, \*.XML, \*.PNG, \*.JPG, \*.GIF → HOST
6. Once the download process is complete, the PIN pad reboots.

### 3.2.2. IBMEFT Emulation Download for Non-IBM ECRs and PCs

In order to allow Ingenico PIN pas to download IBMEFT-compliant packages from a non-IBM ECR or PC host, Ingenico developed IBMEFTDL.EXE, a PC-based program that emulates the IBM ECR download functionality.

**Info** IBMEFTDL.EXE can only be used with RS-232 and USB communication types. A variant of the program (IBMEFTDL\_ETH.EXE) can be used to perform EFT download through Ethernet, provided the correct Host IP and Port settings are specified through TDA.

The emulated IBMEFT download process works as follows:

1. An Ingenico PIN pad connected to the non-IBM ECR or host PC containing the EFT download package is powered up.
2. Once the PIN pad has completed its boot sequence, user executes the download.bat in the EFT package folder.
3. The download.bat file initiates the EFT download process by sending a 01.x message to the PIN pad.
4. PIN pad control is turned over to TDA, which displays a screen showing the download's progress.
5. Once the EFT package has been downloaded, the PIN pad loads the EFT package by moving each of the compressed files it contains to the correct path on the PIN pad's memory:
  - a. \*.TGZ → HOST
  - b. \*.OGZ → SWAP
  - c. \*.PGZ → PIN pad's secure directory
  - d. \*.MP4, \*.DAT, \*.K3Z, \*.XML, \*.PNG, \*.JPG, \*.GIF → HOST
6. Once the download process is complete, the PIN pad reboots.

### 3.2.3. Possible Download Process Errors

Two of error conditions are possible during the IBMEFT download process:

- Loss of communication
- EFT package formatting issue

Both of these error conditions are discussed in more detail below.

#### **3.2.3.1. Lost Communication Error**

If communications between the Ingenico PIN pad and host system are interrupted during an EFT download, the terminal displays a “Lost Communication” prompt on the TDA screen.

#### **3.2.3.2. Corrupt EFT Package Error**

If the Ingenico PIN pad is unable to complete or unpack the EFT download due to a packaging issue, the PIN pad aborts the download and reverts to the previous version of the financial application.

No indication that corrupt files were downloaded is given via the PIN pad display. The terminal reboots after discarding the corrupt EFT files.

## Notes



## 4. Telium Download Application (TDA) Configuration

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The U.S. Retail Telium Download Application (TDA) is an Ingenico PIN pad application that handles the following functionality:

- Communication setting configuration
- Initial download and updates for the following PIN pad software:
  - Financial applications
  - Telium operating system
  - Libraries
  - Telium Manager

### 4.1. Accessing the Telium Download Application

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To access the Telium Download Application on your Ingenico PIN pad, follow these steps:

1. Power up the Ingenico PIN pad.
2. Wait for the gray RBA or UIA splash screen.
3. At the splash screen, press the key combination that corresponds to your PIN pad model:
  - **iSC350** and **iSC250** - [2], [6], [3], [4], [Enter], [+]
  - **iPP350** and **iPP320** - [2], [6], [3], [4], [Enter], [\*]
4. At FUNCTIONS screen, navigate to the TDA icon using your PIN pad's menu navigation keys:
  - **iSC350** and **iSC250** – [-] and [+]
  - **iPP350** and **iPP320** – [F2] and [F3]
5. **Once you have selected the TDA icon, press [Enter].** The main TDA menu displays.

## 4.2. Configuring PIN Pad Download Methods

### 4.2.1. Setting PIN Pad Download Type

To select the type of download method to use for the PIN pad, follow these steps:

Step	PIN Pad Display	Merchant Action	Notes
1.	<b>TDA</b> 0- Configuration 1- Download 2- Remote Download 3- TMS Download 4- Activate Software	From the main TDA screen, press [0] -or- Press [Enter] for Configuration.	
2.	<b>CONFIGURATION</b> 0- Communication 1- Download Type 2- EFT	Press [1] for Download Type.	
3.	<b>DOWNLOAD AS</b> 0- EFT 1- Telium Manager 2- PinPad Agent	Press the number corresponding to the desired download type, then press [Cancel] or [Clear] twice.	
4.	<b>SAVE AND REBOOT?</b> 0- No 1- Yes	Press [1] for Yes to save any updated settings and reboot the PIN pad.	

### 4.2.2. Configuring EFT Settings

To configure EFT settings, follow these steps:

Step	PIN Pad Display	Merchant Action	Notes
1.	<b>TDA</b> 0- Configuration 1- Download 2- Remote Download 3- TMS Download 4- Activate Software	From the main TDA screen, press [0] -or- Press [Enter] for Configuration.	
2.	<b>TDA</b> 0- Communication 1- Download Type 2- EFT	Press [2] for EFT.	

Step	PIN Pad Display	Merchant Action	Notes
3.	<div>EFT</div> <div>0- EFTL</div> <div>1- EFTP</div> <div>2- Manufacture ID</div> <div>3- Product ID</div>	Press [0] for EFTL.	
4.	<div>EFTL</div> <div>Current value = 0000</div>	Type an EFTL value to set for the PIN pad, then press [Enter].	The EFTL field is updated after the PIN pad performs a successful EFT download.
5.	<div>EFT</div> <div>0- EFTL</div> <div>1- EFTP</div> <div>2- Manufacture ID</div> <div>3- Product ID</div>	Press [1] for EFTP.	
6.	<div>EFTP</div> <div>Current value = 0000</div>	Type an EFTP value to set for the PIN pad, then press [Enter].	The EFTP field is updated after the PIN pad performs a successful EFT download.
7.	<div>EFT</div> <div>0- EFTL</div> <div>1- EFTP</div> <div>2- Manufacture ID</div> <div>3- Product ID</div>	Press [2] for Manufacture ID.	
8.	<div>MANUFACTURE ID</div> <div>Current value = INGNAR</div>	Type a Manufacture ID value to set for the PIN pad, then press [Enter].	<p>The Manufacture ID field is used to allow EFT downloads from legacy IBM ECRs.</p> <p><b>info</b> This field should only be changed manually for testing purposes. For multiple devices, update this value using TDA.xml.</p>
9.	<div>EFT</div> <div>0- EFTL</div> <div>1- EFTP</div> <div>2- Manufacture ID</div> <div>3- Product ID</div>	Press [3] for Product ID.	
10.	<div>PRODUCT ID</div> <div>Current value =</div>	Type a Product ID value to set for the PIN pad, then press [Enter].	<p>The Product ID field is used to allow EFT downloads from legacy IBM ECRs.</p> <p><b>info</b> This field should only be changed manually for testing purposes. For multiple devices, update this value using TDA.xml.</p>

Step	PIN Pad Display	Merchant Action	Notes
11.	<div style="border: 1px solid black; padding: 5px;"> <b>EFT</b>  0– EFTL  1– EFTP  2– Manufacture ID  3– Product ID </div>	Press [Cancel] or [Clear] twice.	
12.	<div style="border: 1px solid black; padding: 5px;"> <b>SAVE AND REBOOT?</b>  0– No  1– Yes </div>	Press [1] for Yes to save any updated settings and reboot the PIN pad.	

### 4.3. Triggering Downloads From TDA

#### 4.3.1. EFT Downloads

Ingenico Telium PIN pads that are equipped with a financial application (e.g. UIA or RBA) will automatically check the POS for updates during startup, and trigger a download if necessary.

In order to allow Telium PIN pads that are NOT equipped with a financial application to download EFT packages from a POS, TDA can be manually placed into a download state.

To enable EFT downloads through TDA, follow these steps:

Step	PIN Pad Display	Merchant Action	Notes
1.	<div style="border: 1px solid black; padding: 5px;"> <b>TDA</b>  0– Configuration  1– Download  2– Remote Download  3– TMS Download  4– Activate Software </div>	From the main TDA screen, select [1] for Download.	
2.	<div style="border: 1px solid black; padding: 5px;"> <b>Waiting for download...</b> </div>	Once the PIN pad displays the “Waiting for download...” screen, it is ready to receive an EFT package from the POS.	At this point, the EFT transfer can be initiated from the POS.

#### 4.3.2. Remote Downloads

Contact your account manager for information on IngEstate downloads.

#### 4.3.3. TMS Downloads

Contact your account manager for information on IngEstate downloads.

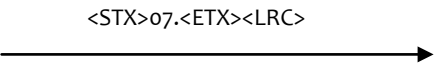
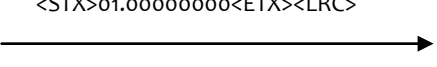
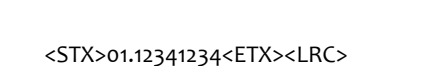
## 5. EFT Download Transaction Examples

This chapter contains example message exchanges for various EFT download-related scenarios involving a PIN pad and POS system. These examples are included to give developers a better understanding of the message exchanges required to execute a successful EFT download. Developers should use these message exchanges as examples when implementing EFT downloads from unsupported hosts such as Linux or Macintosh-based systems.

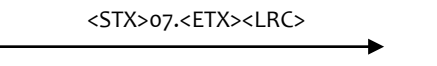
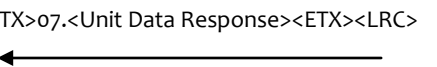
For each message exchange, unit data requests precede each online request in order for the ECR to determine the type of terminal it is connected to and to thus know what EFTL and EFTP file set needs to be referenced during a load session. Online requests are followed by a program and parameter load, and then an online response. Variations on this theme are presented as well.

All cases presented in this chapter assume that the PIN pad initially contains an EFTL level of 1234 and an EFTP level of 1234.

### 5.1. Online Request with 0000 EFTL and EFTP Levels

Register	Messages	Terminal
Unit data request.		
		Unit data response identifying terminal type ECR is connected to.
Online request sent to terminal.		
		Online response sent to register. In this case no download can occur. Terminal only returns current EFTL and EFTP version numbers.






### 5.2. Online Request with Current EFTL and EFTP Levels

Register	Messages	Terminal
Unit data request.		
		Unit data response identifying terminal type ECR is connected to.








Register	Messages	Terminal
Online request sent to terminal.	<p style="text-align: center;">&lt;STX&gt;01.12341234&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;01.12341234&lt;ETX&gt;&lt;LRC&gt;</p>	Online response sent to register. In this case no download is required as the terminal has the identical version of software as in the EFTL and EFTP files.

### 5.3. Online Request with New EFTL and EFTP Levels

Register	Messages	Terminal
Unit data request.	<p style="text-align: center;">&lt;STX&gt;07.&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;07.&lt;Unit Data Response&gt;&lt;ETX&gt;&lt;LRC&gt;</p>	Unit data response identifying terminal type ECR is connected to.
Online request sent to terminal.	<p style="text-align: center;">&lt;STX&gt;01.56785678&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p>	Program load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 1&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record 1.
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p>	Next program load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 2&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record 2
	.	
	.	
	.	
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p>	Next program load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record N.
	<p style="text-align: center;">←</p> <p style="text-align: center;">&lt;STX&gt;59.123456781&lt;ETX&gt;&lt;LRC&gt;</p>	Initial parameter load request.






Register	Messages	Terminal
	<STX>900112345678<Param Record 1><FS><ETX><LRC> 	Parameter record 1.
	<STX>900112345678<Param Record 2><FS><ETX><LRC> 	Parameter record 2.
	. . .	
	<STX>9nn012345678<Param Record N><FS><ETX><LRC> 	Parameter record N.
	<STX>59.1234567821<ETX><LRC> 	Parameter confirmation response with a success status.
	<STX>01.56785678<ETX><LRC> 	Online response sent to register after completed download.

#### 5.4. Online Request with New EFTL Level 01 Extended Commands

Register	Messages	Terminal
Unit data request.	<STX>07.<ETX><LRC> 	
	<STX>07.<Unit Data Response><ETX><LRC> 	Unit data response identifying terminal type ECR is connected to.
Online request sent to terminal.	<STX>01.56785678<ETX><LRC> 	
	<STX>02.12345678<ETX><LRC> 	Program load request.
ECR indicates extended support is available.	<STX>40.01<ETX><LRC> 	Terminal can use advanced download level 01 commands during EFTL load process.
	<STX>02.12345678<ETX><LRC> 	Program load request.
	<STX>02.12345678<Prog Record 1><FS><ETX><LRC> 	Load index record 1.

Register	Messages	Terminal
	<p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p>	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Last index record load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load last index record N.
	<p style="text-align: center;">&lt;STX&gt;41.12345678&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Rewind EFTL file to start.
Confirmation that rewind command has completed.	<p style="text-align: center;">&lt;STX&gt;42. &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">&lt;STX&gt;43.1234567800100&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Skip 100 records from the top of file.
Confirmation that skip command has completed.	<p style="text-align: center;">&lt;STX&gt;44. &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Component load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 1&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record 1.
	<p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p>	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Last component load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record N.
	<p style="text-align: center;">.</p> <p style="text-align: center;">.</p> <p style="text-align: center;">.</p>	
	<p style="text-align: center;">&lt;STX&gt;45.1234567810&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Request ECR to suspend for 10 minutes while all binary files put into their final destination in the CFS and the DFS is cleaned up.
Confirmation that suspend is agreed to by the ECR.	<p style="text-align: center;">&lt;STX&gt;46. &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	



Register	Messages	Terminal
	<p>.</p> <p>Wait for up to 2 minutes for terminal to complete processing.</p> <p>.</p>	
	<p>&lt;STX&gt;59.123456781&lt;ETX&gt;&lt;LRC&gt;</p> 	Initial parameter load request.
	<p>&lt;STX&gt;900112345678&lt;Param Record 1&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> 	Parameter record 1.
	<p>.</p> <p>.</p> <p>.</p>	
	<p>&lt;STX&gt;9nn012345678&lt;Param Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> 	Parameter record N.
	<p>&lt;STX&gt;59.1234567821&lt;ETX&gt;&lt;LRC&gt;</p> 	Parameter confirmation response with a success status.
	<p>&lt;STX&gt;01.56785678&lt;ETX&gt;&lt;LRC&gt;</p> 	Online response sent to register after completed program download.

## 5.5. Online Request with New EFTL Level 02 Extended Commands

When using support level 02, 2 additional commands are available for use.

The 47. message requests the register to load N EFTL blocks without the PIN pad requesting each block (i.e., no 02. request will be issued from the PIN pad for each block).



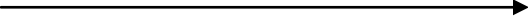









The 48. message response informs the PIN pad that the transmission of N EFTL blocks is complete. A status of the completion is also included in the message.

The diagram below represents the normal use of the 47. request and 48. response is used.





If an error is found by the PIN pad during the read operation, the PIN pad will continue to receive as many of the host 02. messages as possible, however these messages will only be ACKed and thrown away. The PIN pad will continue to receive until the number of blocks requested for the read has been received or until a 48. message terminating the read is received.

If the host stops sending blocks prematurely then the PIN pad should timeout on the receive of the block wait for the 48. from the host and then resume control. The PIN pad can then attempt to retry the read operation or it may elect to terminate the download session.

Note, the completion statuses returning to the PIN pad in the 48.xx message.

Register	Messages	Terminal
Unit data request.	<p style="text-align: center;">&lt;STX&gt;07.&lt;ETX&gt;&lt;LRC&gt;</p> 	
	<p style="text-align: center;">&lt;STX&gt;07.&lt;Unit Data Response&gt;&lt;ETX&gt;&lt;LRC&gt;</p> 	Unit data response identifying terminal type ECR is connected to.
Online request sent to terminal.	<p style="text-align: center;">&lt;STX&gt;01.56785678&lt;ETX&gt;&lt;LRC&gt;</p> 	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> 	Program load request.
ECR indicates extended support is available.	<p style="text-align: center;">&lt;STX&gt;40.02&lt;ETX&gt;&lt;LRC&gt;</p> 	Terminal can use advanced download level 02 commands during EFTL load process.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> 	Program load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 1&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> 	Load index record 1.
	<p>· · ·</p>	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;ETX&gt;&lt;LRC&gt;</p> 	Last index record load request.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> 	Load last index record N.
	<p style="text-align: center;">&lt;STX&gt;41.12345678&lt;ETX&gt;&lt;LRC&gt;</p> 	Rewind EFTL file to start.
Confirmation that rewind command has completed.	<p style="text-align: center;">&lt;STX&gt;42.&lt;ETX&gt;&lt;LRC&gt;</p> 	
	<p style="text-align: center;">&lt;STX&gt;43.1234567800100&lt;ETX&gt;&lt;LRC&gt;</p> 	Skip 100 records from the top of file.

Register	Messages	Terminal
Confirmation that skip command has completed.	<p style="text-align: center;">&lt;STX&gt;44. &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	<p style="text-align: center;">&lt;STX&gt;47.1234567800100&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Request to read 100 EFTL records with no 02. request from PIN pad.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 1&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record 1.
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record 2&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record 2.
	.	
	.	
	.	
	<p style="text-align: center;">&lt;STX&gt;02.12345678&lt;Prog Record N&gt;&lt;FS&gt;&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	Load record N.
Read completion of 100 records from register. Control provided back to PIN pad for next operation.	<p style="text-align: center;">&lt;STX&gt;48.00 &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	.	
	.	
	.	
	<p style="text-align: center;">&lt;STX&gt;45.1234567810&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Request ECR to suspend for 10 minutes while all binary files put into their final destination in the CFS and the DFS is cleaned up.
Confirmation that suspend is agreed to by the ECR.	<p style="text-align: center;">&lt;STX&gt;46. &lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">→</p>	
	.	
	Wait for up to 2 minutes for terminal to complete processing.	
	.	
	<p style="text-align: center;">&lt;STX&gt;59.123456781&lt;ETX&gt;&lt;LRC&gt;</p> <p style="text-align: center;">←</p>	Initial parameter load request.

Register	Messages	Terminal
	<STX>900112345678<Param Record 1><FS><ETX><LRC> 	Parameter record 1.
	. . .	
	<STX>9nn012345678<Param Record N><FS><ETX><LRC> 	Parameter record N.
	<STX>59.1234567821<ETX><LRC> 	Parameter confirmation response with a success status.
	<STX>01.56785678<ETX><LRC> 	Online response sent to register after completed program download.

## Notes

## 6. Other Download Methods

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### 6.1. TMS Agent / PINpad Agent

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Contact your account manager for information on TMS Agent / PINpad Agent downloads.



*TMS Agent / PINpad Agent do not support USB-HID communication.*

### 6.2. IngEstate Download

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Contact your account manager for information on IngEstate downloads.

## Notes

## Appendix A. Host Interface Messages

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### A.1. 00.x – Offline Message

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Offset	Length	Type	Description
0	1	constant	ASCII control character - STX
1	3	constant	Message Identifier - ASCII - 00.
4	4	decimal	Offline reason code as follows, OFFLINE from MSR/PIN to 4683 terminal 0000 - no errors present 08xx - MSR/PIN not understood 10xx - request not understood 20xx - request not valid OFFLINE from 4683 terminal to MSR/PIN 0000 - all cases
8	1	constant	ASCII control character - ETX
9	1	binary	LRC check character

The OFFLINE message is architected to flow in either direction. The OFFLINE message contains a four (4) character status field identifying the reason for being offline.

The MSR/PIN device will come up in offline state following a power on, a PLD (power line disturbance) or loss of DTR signal. It will enter offline state if it detects an unrecoverable error within itself, if it detects invalid message protocol from the HOST or if it receives an OFFLINE message from the HOST.

In offline state, the device will reset any previous consumer data and will not receive any additional consumer data. When allowed to send a message, it will respond with the OFFLINE message, identifying the reason for being offline, to all messages except ONLINE. Upon receiving an ONLINE message, the device will attempt to go ONLINE. If successful, it will send an ONLINE Response indicating it has entered online state; otherwise, it will respond with an OFFLINE message.

### A.2. 01.x – Online Message Format

---

Offset	Length	Type	Description
0	1	constant	ASCII control character - STX
1	3	constant	Message Identifier - ASCII - 01.
4	4	decimal	Program load version number
8	4	decimal	Parameter load version number
12	1	constant	ASCII control character - ETX
13	1	binary	LRC check character



The ONLINE message flows in both directions as a request/response pair.

The ONLINE Message Data consists of two fields, program load version, and parameter load version. They indicate the level of program and parameter load that should currently be contained in that MSR/PIN device. The MSR/PIN device will validate it contains the current levels before accepting the ONLINE request. If either level is incorrect, it will request a load of the pieces that are incorrect. The level in the ONLINE request forcing the load is assigned to be the level of the new load. Zero (0000) in either field of the ONLINE request is a special case indicating to the device to use the level it currently contains of that piece. If the device does not contain any level for that piece, it will return an OFFLINE message; otherwise, the ONLINE response will contain the current level value for that piece.

### A.3. 02.x – Program Load Message

---

An online response may be sent instead of the parameter load confirmation response message to indicate a successful parameter download, or an offline response message may be sent instead to indicate an unsuccessful parameter download.

#### A.3.1. Request Format

Offset	Length	Type	Description
0	1	constant	ASCII control character - STX
1	3	constant	Message Identifier - ASCII - 02.
4	8	alphanum	Terminal serial number
12	1	constant	ASCII control character - ETX
13	1	binary	LRC check character

#### A.3.2. Response Format

Offset	Length	Type	Description
0	1	constant	ASCII control character - STX
1	3	constant	Message Identifier - ASCII - 02.
4	8	alphanum	Terminal serial number
12	variable	binary	Program load data (6 to 233 bytes)
n	1	constant	ASCII control character - ETX
n+1	1	binary	LRC check character

### A.4. 40.x – IBMEFT DLL Support Level Request Format

---

Offset	Length	Type	Description
0	1	Constant	ASCII control char - STX
1	3	Constant	Message Identifier - ASCII - 40.

Offset	Length	Type	Description
4	2	Alphanum	Extended message support level: <ul style="list-style-type: none"> <li>• 00 – No extended message support (terminal default).</li> <li>• 01 – Extended message support including messages 41 to 46.</li> <li>• 02 – Extended message support including messages 41 to 48 (currently not implemented in i6xxx products).</li> </ul>
6	1	Constant	ASCII control char - ETX
7	1	Binary	LRC Check char.

The support level request is sent from the downloading device prior to the issuing of an online request.

Note that there is no response to a support level request, thus the register will see the same result regardless of whether the terminal receiving the command supports block skipping or not.

The following messages are available and may be used based on the detection of the support level. Note, some messages are from the terminal to the downloading device and some are from the downloading device to the terminal.

The additional commands of support level 1 request an action from the downloading device. This action is confirmed by a separate response from the downloading device confirming its completion.

## A.5. 41.x – Program First Record Request Format

Offset	Length	Type	Description
0	1	Constant	ASCII control char - STX
1	3	Constant	Message Identifier - ASCII - 41.
4	8	Alphanum	Terminal Serial Number
12	1	Constant	ASCII control char - ETX
13	1	Binary	LRC Check char.

The program first record request is sent from the terminal to the downloading device. A standard protocol ACK/NAK is assumed and a secondary message response is required.

The program first record request causes the file pointer to be positioned at the start of the file (i.e., at the 1<sup>st</sup> record in the file). No data should be returned from this request. The first record response returns to indicate when the rewind operation has completed.

## A.6. 42.x – Program First Record Response Format

Offset	Length	Type	Description
0	1	Constant	ASCII control char – STX
1	3	Constant	Message Identifier - ASCII – 42.
4	8	Alphanum	Terminal Serial Number

Offset	Length	Type	Description
12	1	Constant	ASCII control char - ETX
13	1	Binary	LRC Check char.

The program first record response is sent from the downloading device to the terminal. A standard protocol ACK/NAK is assumed but no secondary message response is required.


The program first record response indicates the completion of the file pointer repositioning to the start of the file (i.e., at the 1<sup>st</sup> record in the file).

## A.7. 43.x – Program Record Skip Request Format

Offset	Length	Type	Description
0	1	Constant	ASCII control char – STX
1	3	Constant	Message Identifier - ASCII – 43.
4	8	Alphanumeric	Terminal Serial Number
12	5	Alphanumeric	Number of Blocks to Skip - ASCII - 00000 to 99999
17	1	Constant	ASCII control char – ETX
18	1	Binary	LRC Check char.

The program record skip request is sent from the terminal to the downloading device. A standard protocol ACK/NAK is assumed and a secondary message response is required.

The program record skip request causes the file pointer to be positioned at the start of the record after the specified number of lines/blocks. No data should return from this request. However, a confirmation response is issued to indicate when the completion of the skip action has occurred.

 Currently, Telium PIN pads will skip a maximum of 65535 at any one point in time.

## A.8. 44.x – Program Record Skip Response Format

Offset	Length	Type	Description
0	1	Constant	ASCII control char – STX
1	3	Constant	Message Identifier - ASCII – 44.
4	8	Alphanumeric	Terminal Serial Number
12	1	Constant	ASCII control char – ETX
13	1	Binary	LRC Check char.

The program record skip response is sent from the downloading device to the terminal. A standard protocol ACK/NAK is assumed but no secondary message response is required.

The program record skip response is an indication that the file pointer has been repositioned to the start of the record after the number of lines/blocks specified.

## A.9. 45.x – Online Suspend Request Format

---

Offset	Length	Type	Description
0	1	Constant	ASCII control char - STX
1	3	Constant	Message Identifier - ASCII - 45.
4	8	Alphanum	Terminal Serial Number
12	2	Alphanum	Total online suspend timeout period in minutes ASCII "01" – "99" minutes
14	1	Constant	ASCII control char – ETX
15	1	Binary	LRC Check char.

The online suspend request is sent from the terminal to the downloading device. A standard protocol ACK/NAK is assumed.

The online suspend request tells the downloading device that the online process is to be suspended for a maximum of N minutes.

Online operations are resumed by sending either a positioning request (i.e., first or skip), or by requesting a program or parameter load block, or by sending an online or offline completion message.

## A.10. 46.x – Online Suspend Response Format

---

Offset	Length	Type	Description
0	1	Constant	ASCII control char - STX
1	3	Constant	Message Identifier - ASCII - 46.
4	8	Alphanum	PIN pad serial number
12	1	Constant	ASCII control char – ETX
13	1	Binary	LRC Check char.

The online suspend response is sent from the downloading device to the terminal. A standard protocol ACK/NAK is assumed. The online suspend response is sent to indicate that the online process wait has been initiated.

Online operations are resumed by sending either a positioning request (i.e., first or skip), or by requesting a program or parameter load block, or by sending an online or offline completion message.

## A.11. 47.x – Read N ETFL Records Request Format

---

Offset	Length	Type	Description
0	1	Constant	Control character – STX 0x02
1	3	ASCII	Message Identifier – ASCII - 47.
4	8	ASCII	PIN pad serial number

Offset	Length	Type	Description
12	5	ASCII	Number of blocks in decimal ASCII format to read from the current EFTL record position pointer.
17	4	ASCII	Packet pacing time in milliseconds. This is the time after the host receives an ACK from the PIN pad to the sending of the next 02. data packet.
21	1	Constant	Control character – ETX 0x03
18	1	Binary	LRC check character

This message is sent from the PIN pad in order to tell the host that N records from the EFTL file should be read and returned in consecutive 02. download packets.

After receiving this message, the host should read EFTL records one at a time and send N records to the PIN pad without need for the normal 02. EFTL record request. The PIN pad will ACK each 02. EFTL data record message and wait for the next one until all N EFTL records have been received.

The host sends a 48. message once the read is complete. A read completion status is included with the 48. response. At this point the PIN pad resumes control.

### A.12. 48.x – Read N EFTL Records Response Format

Offset	Length	Type	Description
0	1	Constant	Control character – STX 0x02
1	3	ASCII	Message Identifier – ASCII – 48.
4	2	ASCII	Status of read operation. <ul style="list-style-type: none"> <li>• 00 – Read completed successfully.</li> <li>• 01 – A serial error is detected e.g., timeout. The host is providing control back to the PIN pad in order to try and recover and retry, E.g., Timeout on receiving 02. record.</li> <li>• 02 – A file read error has occurred on the host. The application will terminate, E.g., read past end of EFTL file.</li> <li>• 03 – Number of blocks requested to be read is beyond the end of the EFTL file.</li> </ul>
6	1	Constant	Control character – ETX 0x03
5	1	Binary	LRC check character

This message is sent by the host after receiving the 47. read N EFTL record request and a series of 02. data records from the PIN pad.

If a 48.00 message is received after all N 02. records are received then this message acts as a confirmation to the PIN pad that the transfer of all 02. records has completed successfully. All N records have been sent from the host to the PIN pad and the host is now returning master protocol control back to the PIN pad so the PIN pad can make another request.

If a 48.01 message is received before the end of the N records then this means that the host has encountered some communication problem for example a 02. send timeout which has

caused the host to stop sending 02. records. The host is providing master control back to the PIN pad in order for the PIN pad to potentially recover the situation and thus continue the download session.

If the 48.02 or 48.03 or any 48. with a completion status above 03 is received before the end of the N records then a fatal error was encountered by the host not allowing it to continue the load. In this case the PIN pad will terminate its side of the load as well.

## A.13. 59.x – Parameter Load Message

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The Parameter Load message request, response, and parameter load block formats are implemented as defined by the VISA Second Generation specification.

### A.13.1. Request Format

Offset	Length	Type	Description
0	1	constant	ASCII Control Character - STX
1	3	constant	Message Identifier - ASCII - 59.
4	8	alphanum	Terminal Serial Number
12	1	alphanum	Message Type: 1 - Parameter Load Request
13	1	constant	ASCII Control Character - ETX
14	1	binary	LRC Check Character

### A.13.2. Response Format

Offset	Length	Type	Description
0	1	constant	ASCII Control Character - STX
1	3	constant	Message Identifier - ASCII - 59.
4	8	alphanum	Terminal Serial Number
12	1	alphanum	Message Type: 2 - Parameter Load Confirmation Response
13	1	alphanum	Status of Parameter Download: 1 - Successful 0 - Fail
	1	constant	ASCII Control Character - ETX
	1	binary	LRC Check Character



An online response may be sent instead of the Parameter Load response to indicate a successful parameter download. An offline response may also be sent instead of the Parameter Load response to indicate an unsuccessful parameter download.

## A.14. 62.x – RBA

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See DIV350779 Telium RBA User's Guide a full description of the 60.x message.