SMILOG

SOFTWARE FOR MOBILE INTEGRATION IN LOGISTICS

SMITERM 9
Parameter Details

Prepared by: M.J. Brandys

Version: 1.3

Dated: April 2023

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Revision History

1.0		• Initial Release	Mike Brandys	March, 2021
1.1		• Changes to Crypto	Mike Brandys	October, 2021
1.2		• Changes for SmiTerm 9	Mike Brandys	October, 2023
1.3		• SmiTerm 9.10	Mike Brandys	April, 2023

SMITERM was developed to provide a migration path for existing TEKRF and TEKCONSOLE customers. It allows them to continue to run their TEKRF or TEKCONSOLE solution with no changes to their Windows Servers or SAP systems. It provides a terminal emulation program that is compatible with TEKRF and TEKCONSOLE that will run on any Android device, including new industrial terminals, Android phones, and Android tablets.

The first version was created in 2014. We did not see any significant use of Android terminals until 2017 and it is only in the last 3 years that we have seen a significant number of customers moving to Android terminals.

Version 7 was the first release that was widely used. We created Version 8 and included a lot of features that we thought could be used to improve the entire TEKRF / TEKCONSOLE solution, such as speech recognition.

In Version 9, we are focusing on keeping only the features that have been used by end customers and are dropping some of the unused features (a list is provided later in this document). In addition we are rebuilding the code with the latest Android SDK (API version 33 aka Tiramisu) so we are compliant with Google's latest security requirement for APPs. This required upgrading many of the Libraries used (as these have been Deprecated) and adding required prompts requesting permissions from the end user such as access to storage and the camera.

In addition we are trying to improve the overall user experience particularly for devices that have no physical keyboard.

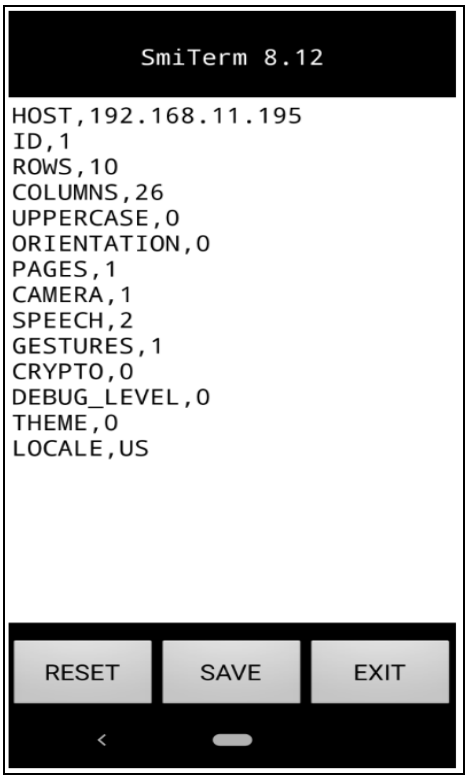
Configuring SMITERM

SMITERM is configured by editing a comma delimited configuration file.

The contents of this file could be scanned in using a single 2D barcode.

The configuration file is edited by pressing the ”CONFIG” button, on the “button bar” (often referred to as the FLING BAR, because it can be scrolled left or right)

The following screen will appear,



Normally, only the HOST, ID, ROWS, COLUMNS parameters need to be changed.:
These will be specific to each customer’s TEKRF or TEKCONSOLE system.

Often the Non-TEKRF input features, example CAMERA, are disabled by setting to values to Zero.

NOTE: There have been significant changes in the number of parameters available. Not all parameters are included in the default (Reset) configuration. If a parameter is not included in Configuration then default value is used.

Each of the configuration parameters are can be found in the next sections:

HOST CONNECTION

Host connection address:

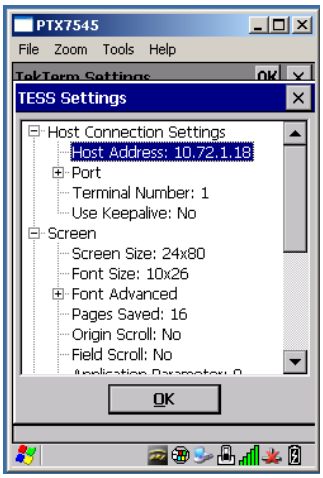
HOST, <value>

Where <value> is the IP address or DNS name of the TEKRF or TEKCONSOLE server.

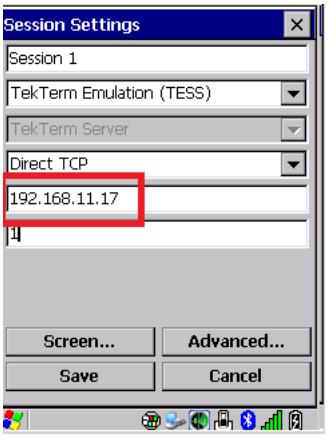
Default: 192.168.11.222

If you are currently using TEKTERM, then this is the same value used for the Host Address parameter shown below

For TEKTERM 5



For TEKTERM 7,8,9



Host License:

HOST_LICENSE, <value>

Where <value> is 16 digit key that is specifically for the decoding the HOST value

Default:

Terminal ID:

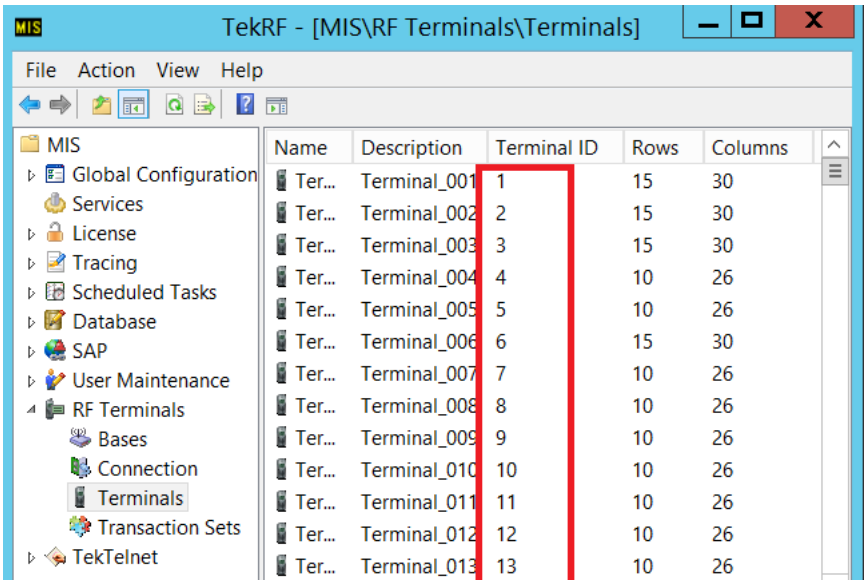
ID, <value>

Where <value> is the Terminal ID on the TEKRF or TEKCONSOLE server, or controller

Default: 1

The terminal ID must be valid, and not in use by another Device.

You can find a list of valid terminal IDs in the MIS administration program



If a terminal ID is being used by another device the SmiTerm Session will continuously disconnect and reconnect.

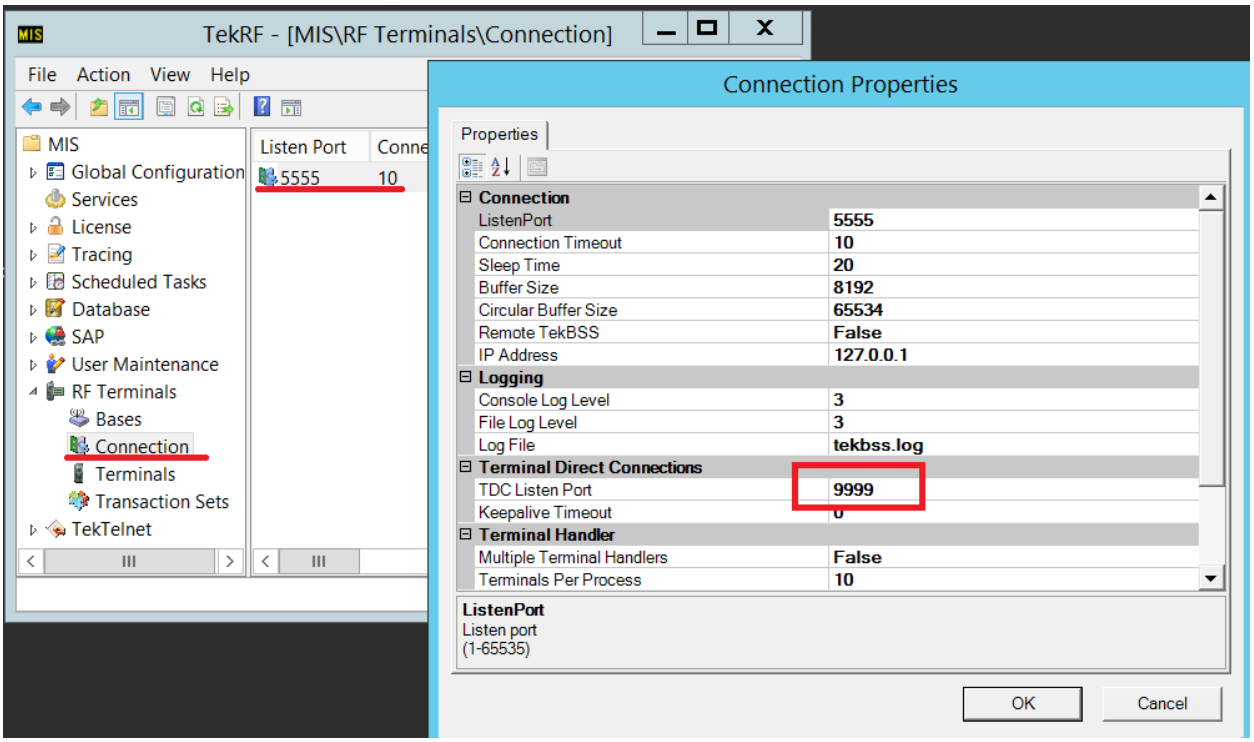
TESS TCP port

PORT, <value>

Where <value> is the TCP port used to connect to the TEKRF or TEKCONSOLE server, or controller

Default: 9999

For Terminals connecting directly to the MIS service, this is the value **TDC Listen Port** found in the Connection Properties



Number of Pages (Page Saving)

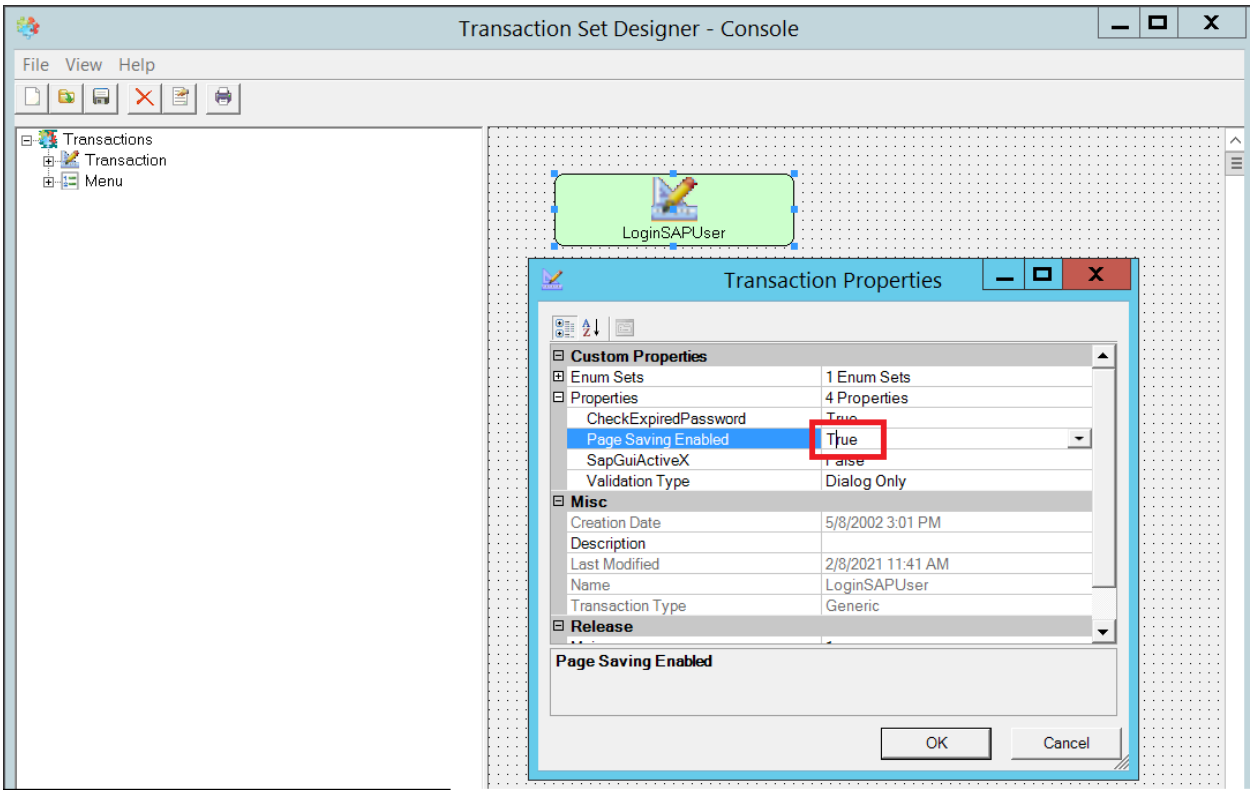
PAGES, <value>

Where <value> is the number pages used in Page Saving. 1-16

Default 1 (No Page Saving)

This value can be set to a number greater than 1 to enable page saving. TEKTERM usually provides 16 pages.

Page Saving is typically not used by most TEKRF transactions. It can be set in the CONSOLE transactions set by modifying the properties of the LoginSAPUser Transaction.



It is recommended that page saving not be used with SmiTerm. This is because page saving was designed to reduce the amount of data sent to Narrow Band devices. Since SmiTerm uses WiFi, there is no need to reduce the amount of data sent as there is usually at least 2 MB/s of bandwidth available compared to the 9600 B/s available for Narrow Band.

Terminal Model Number (TekTerm)

MODEL, <value>

It is recommend that you do not change this, Required to send correct Initialization String

Default 200

Software release (TekTerm)

SOFTWARE, <value>

It is recommend that you do not change this, Required to send correct Initialization String

Default 69

Enable SSL data exchange

CRYPTO, <value>

Where <value> = 0 to disable SSL data exchange, all data will be sent in plain text

<value> = 1 to enable SSL data exchange, all data will be encrypted.

<value> = 2 to enable SSL data exchange, but ignores Certificate, all data will be encrypted.

Default 0

NOTE: The TESS protocol is NOT SECURE! All data is sent in plain text. Anyone monitoring the network data can easily see important information, like the user's password.

At typical login transaction will send the following when "user1" logs in with password "admin"

3RF16=45user1=65admin

SmiTerm provides a way to make to secure this data exchange using SSL, so this data is encrypted.

The server needs to be equipped with a SSL gateway like STUNNEL

https://www.stunnel.org/

To make secure connection on port 8888 without requiring a SSL certificate, set the following in the STUNNEL configuration

[tess]
accept = 8888
connect = 9999
verify = 0

In SmiTerm Set:

CRYPTO,2
PORT,8888

This protects the password on the network, but it does not protect the password once it arrives at the servers. Anyone can examine the TEKBSS log and find the same TESS data string that includes the password.

SCREEN LAYOUT

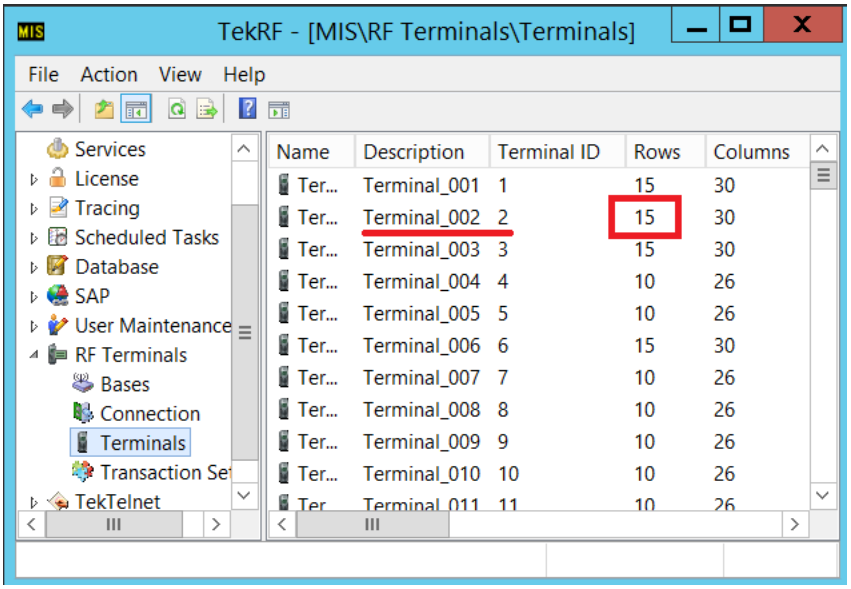
Number of Rows

ROWS, <value>

Where <value> is the number of rows to display on the screen, this is usually either 10 or 15

Default: 10

The Value assigned to ROWS, should match the value for Rows for the Terminal ID used, as found in the MIS administration program.



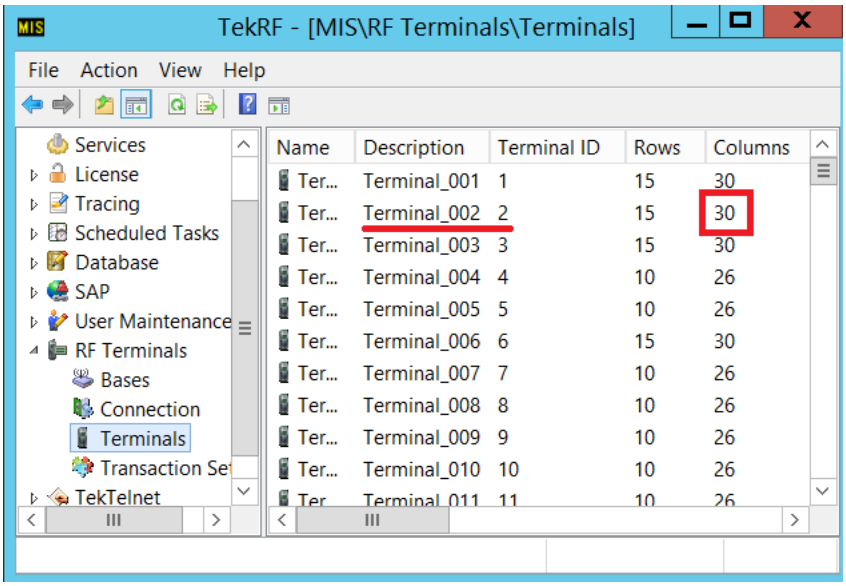
Number of Columns

COLUMNS, <value>

Where <value> is the number of rows to display on the screen, this is usually 26 or 30

Default: 26

The Value assigned to ROW, should match the value for Columns for the Terminal ID used, as found in the MIS administration program.



Screen Orientation

ORIENTATION, <value>

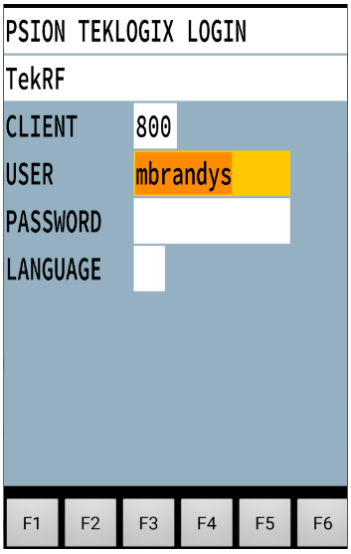
Where <value> = 0 Portrait.

<value> = 1 Landscape

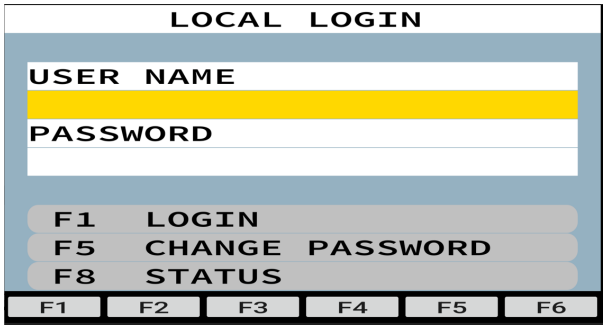
<value> = 2 Reverse Portrait (upside down).

<value> = 3 Reverse Landscape (upside down).

Default 0 (Portrait)



Portrait



Landscape (improved in version 9)

Screen Color Theme

THEME, <value>

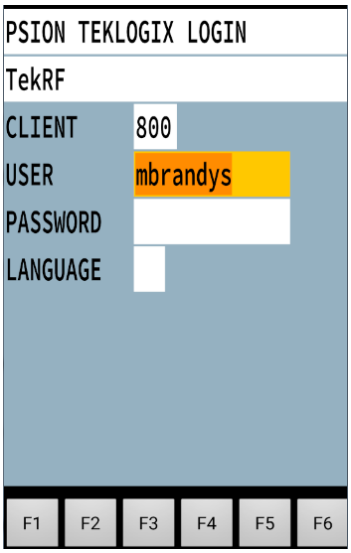
Where <value> = 0 use default smiTerm colors

<value> = 1 use Dark Mode colors

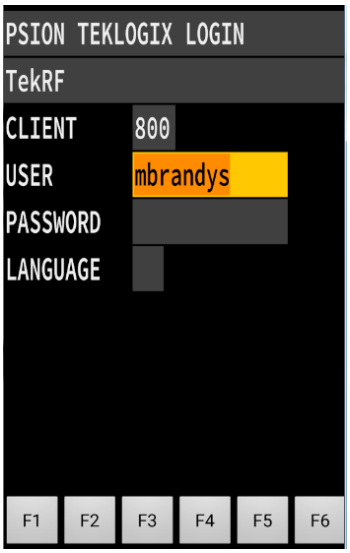
<value> = 2 use TekTerm default colors (black and white)

<value> = 3 use new Legacy Green Screen

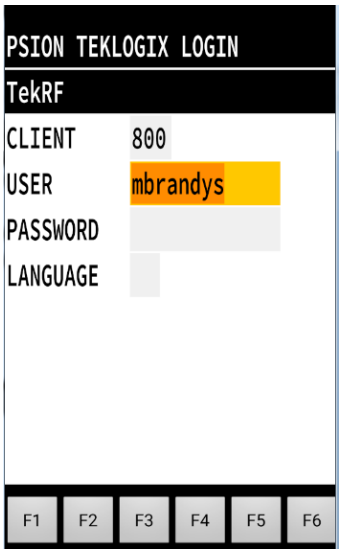
Default: 0



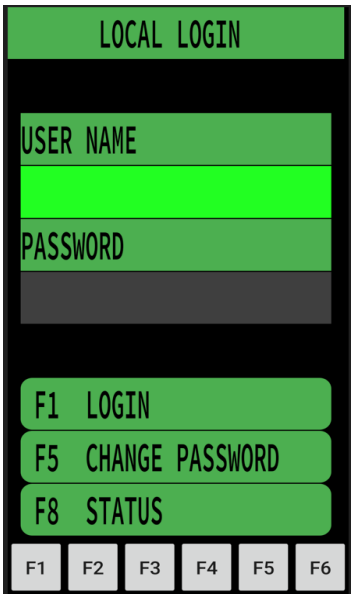
0 (Default)



1 (Dark)



2 (TekTerm)



3 (New: Legacy Green Screen)

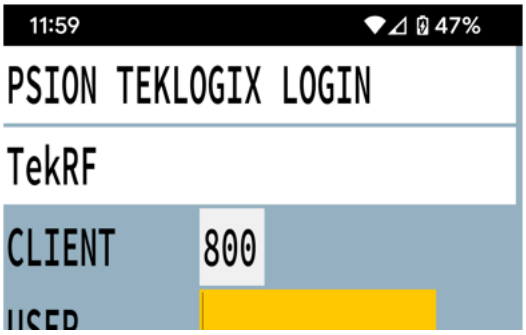
Full Screen options

FULL_SCREEN, <value>

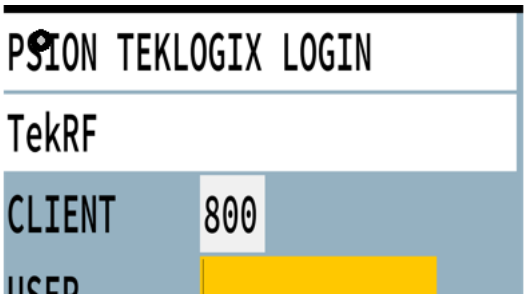
Where <value> = 0 disables full screen mode. Status Indicators at the top screen are visible.

<value> = 1 full screen.

Default: 1



0 - status indicator remain visible at the top of the screen



1 – Full screen. Indicators will be hidden, but gaps and cut-outs for cameras may obscure the image.

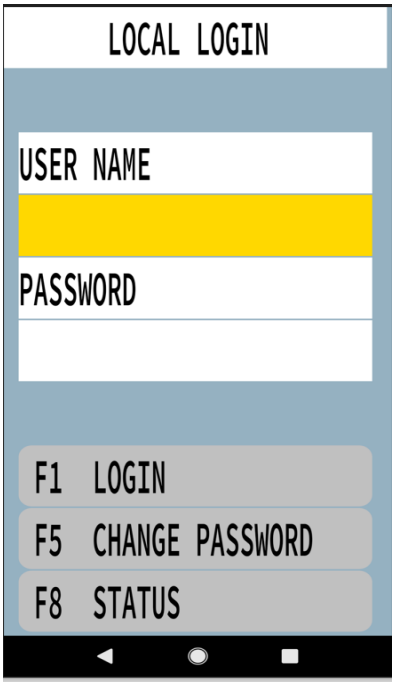
FKEY Fling Bar location

BAR, <value>

BAR,0 Bar is visible, Bar will scroll with view.

BAR,1 Bar is hidden but can be scrolled into view, Bar will scroll with view.

Default: 0



Bar 1, where keyboard is hidden off screen, but can be scrolled into view.

DATA INPUT / OUTPUT

Enable Uppercase only input

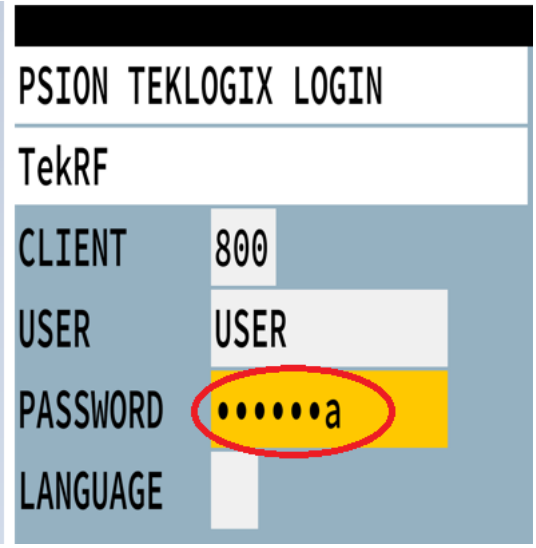
UPPERCASE, <value>

Where <value> = 0 to disable uppercase only. (mixed case)

<value> = 1 convert to upper cases except for password fields.

<value> = 2 convert to upper cases for all fields.

Default: 0 (mixed case)



Option 2 only affects hidden or password fields, which are typically found on the login screen. (circled in Red). This will permit mixed case entry for passwords only

Note: Typically SAP expects the data to be in uppercase but does support mixed case passwords.

Keyboard Only (Disable Popup Keyboard)

KEYBOARD, <value>

Where <value> = 0 use both

<value> = 1 use physical keyboard only, .

Default: 0

Note: In most cases this is configured on the device, so this parameter is not required. It is recommended that you use the device's configuration options to avoid unwanted keyboard popups.

Enable Camera

CAMERA, <value>

Where <value> = 0 to disable camera as scanner,

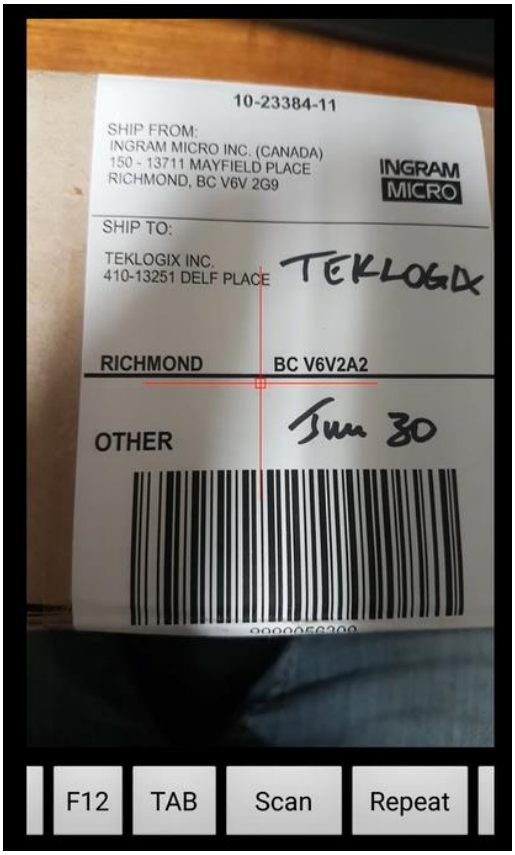
<value> = 1 to enable camera as barcode scanner,

Default 1 (on)

If the Android device is equipped with a camera, the camera can be used as a barcode scanner. The built in scanner application can read 1D and 2D barcodes

The build in Scanner application uses “Googles Play Services”. All full versions of Android include this, but Some terminals may be uses a custom version of Android that does not include Applications licenses for Android like the Google Play Store.

The Scanner shows the view of the camera, if the center of the red “cross hairs” touch the barcode it will be read automatically. If the SCAN button is press and held, the scanning will be suspended until the SCAN button is released, this allows for aiming before scanning. The screen will be slightly greyed out while scanning is suspended.



UTF8 support

UTF, <value>

Enables support for International / Multibyte characters by using UTF8 character set.

Where <value> = 0 use default Western European Code Page (use ISO-8859-1)

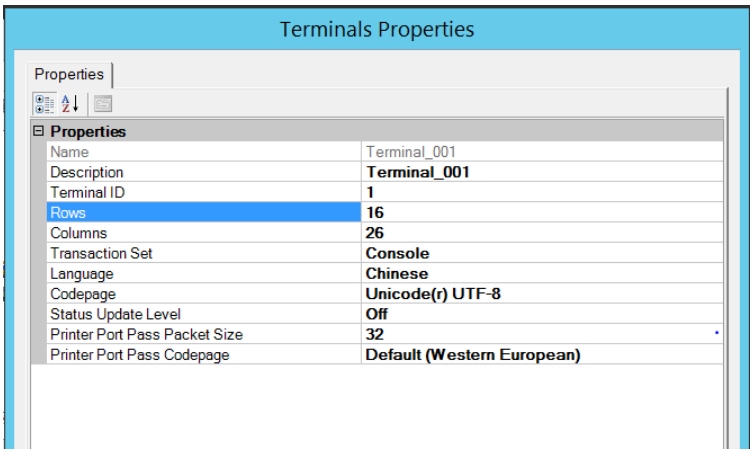
<value> = 1 use UniCode(r) UTF8

Default: 0

UTF is required for many languages the uses multiple bytes to represent a character.

Example Chinese.

If the terminal properties in MIS administration are set as below, Chinese characters can be displayed if **UTF,1** is set in the configuration.



Override Device Locale

LOCALE, <value>

Where <value> = DEVICE (uses the devices locale)

<value> = US (English)

<value> = DE (German)

<value> = FR (French)

Default: US

Changing the locale will change the language of various pop-up prompts and the buttons on the Fling Bar.

It also will affect the Speech Features, including Text to Speech and Speech Recognition.

AIAG Prefix Filter

AIAG_FILTER, <value>

Where <value> = 1 remove AIAG prefix

<value> = 0 do not AIAG remove prefix

Default: 0

Remove Example: For an AIAG Prefix of P, scanning or manually entering P123456 will result in the field being changed to 123456
If you wanted P123456 to be sent to SAP, then the user would have to manually enter PP123456.

Note: For AIAG parsing, a better approach is to use the internal barcode parsing, but this requires configuring the scanner to append a prefix to each scan (See Scan Prefix)

Scan Prefix

SCAN_PREFIX, <value>

Where <value> is set to single character that will trigger “scan to configure” and “AIAG barcode parsing”

This can be set to a space character (Blank) to completely disable the scan features

Default: ~ (ascii 126, hex 0x7E)

Note: For this feature to work, the Scan Prefix Character needs to be added through the device’s scanner configuration, typically this is a Wedge Reader application like Zebra’s DATAWEDGE app.

SOUND Options (BEEP)

BEEP, <value>

Where <value> = 0 No Sounds

<value> = 1 Beep on Error messages only

<value> = 2 Beep on Error messages and Function key presses

<value> = 3 Beep and Vibrate on Error messages and Function key presses

Default: 1

Override the default Error Sound by copying error.mp3 file to DOWNLOADS directory

Override the default Function Key Sound by copying normal.mp3 file to DOWNLOADS directory

Printing:

PRINTER<x>, <parm1>:<parm2>:<parm3>

Printing output from TEKRF and TEKCONSOLE uses the TESS port pass command. The port can be redirected to a variety of devices.

The following parameters control the Redirecting of these ports.

PRINTER1 <tess port pass 1>

PRINTER2 <tess port pass 2>

PRINTER3 TTS (Text to Speech)

Note: Typically Ports 1 and 2 are used in custom TEKRF and TEKCONSOLE transactions.

For Tethering Printers to the terminals USB port use

PRINTER<x>,USB

Example: PRINTER1,USB

For Network Printers use

PRINTER<x>,NETWORK:<IP address>:<Port>

If the IP address is not entered then it will default to 127.0.0.1
If the Port is not entered then it will default to TCP port 9200

Example: PRINTER2,NETWORK:192.168.1.200:6101

For BlueTooth Printers use

PRINTER<x>,BLUETOOTH:<Name of Paired Device>

Note: If the Name of the Paired Device is not entered then the first paired device found will be used. This can be useful if you only ever pair one printer at a time with the android device. (and have no other paired devices)

Example: PRINTER1,BLUETOOTH:MyPrinter

MISC.

Auto License Web address

LICENSE_URL <value>

Where <value> address of web service use to automatically deliver license keys"

This can be set to a space character (Blank) to completely disable this feature

Default: http://portal.smilog.ca/myLicense/Service1.svc/json/

Below is an example of the full URL,
The data sent is the 16 byte ID, the first 12 bytes are the MAC address of the device.

http://portal.smilog.ca/myLicense/Service1.svc/json/1234567890AB0000

The JSON string below is returned if the license server does not recognize the ID.

{"SmiTermKeyResult":"<request send>"}

The JSON string below is returned if the license server recognizes the ID, this includes the 16 byte License key.

{"SmiTermKeyResult":"1111222333334444"}

Once the a license has been successfully installed, the application will not attempt to contact the license server until the license has expired or has been deleted.

Debug level

DEBUG_LEVEL, <value>

Where <value> = 0 to 10. The higher the number, the more details that are sent to iLog.

Default: 0

if DEBUG is set any value other than 0, all data sent and debug data can be viewed or export

a (!) symbol will appear on the Fling Bar that will allow the user to launch the Popup Debug Screen.

It is recommended you do not run Debug unless you are trouble-shooting, as it will impact performance.

SECURITY WARNING, on Debug level 10 everything that is typed is saved, including passwords.

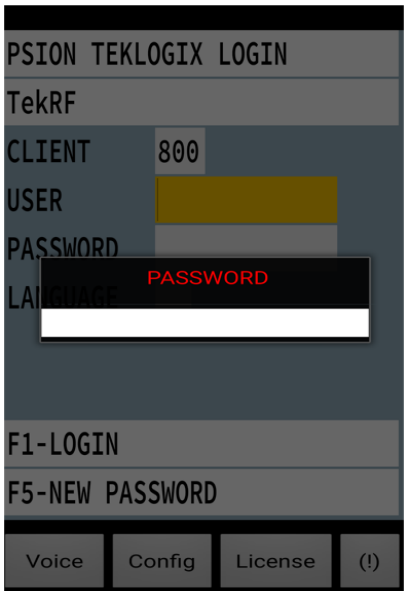
LOCK Configuration

LOCK, <value>

Where <value> is the password, up to 16 characters. Will not prompt for a password when the CONFIG button is pressed if blank.

Default: <blank>

If a value has been set, a popup will appear when the CONFIG button is pressed



FIELD ORDER (new)

FIELD_ORDER, <value>

FIELD_ORDER,0 TekTerm Field order N (recommended configuration)

FIELD_ORDER,1 TekTerm Field order Y

FIELD_ORDER,2 Backward compatible with TekTelnet and SmiTerm 5.

Default: 0

Scan to Configure

Any of the configuration parameters can also be scanned in by creating a code 128 barcode with the following format

(scan prefix)**<**(parmeter)**,**(value)**>**

Example: **~<HOST,10.0.0.1>** will set the host connection to IP address 10.0.0.1
Example: **~<THEME,1>** will set the screen colors to Dark Mode

The configuration can be reset using the RESET Command

Example: **~<RESET,0>**

After a configuration barcode is scanned the edges of the screen will become red (as illustrated below)

Multiple barcodes can be scanned, but will not take effect until the WRITE command is scanned.

Example: **~<WRITE,0>**

Or the changes can be cancelled using the CANCEL command, or by restart the application, or pressing the CONFIG button.

Example: **~<CANCEL,0>**

Once the WRITE Command is scanned the application is restarted.

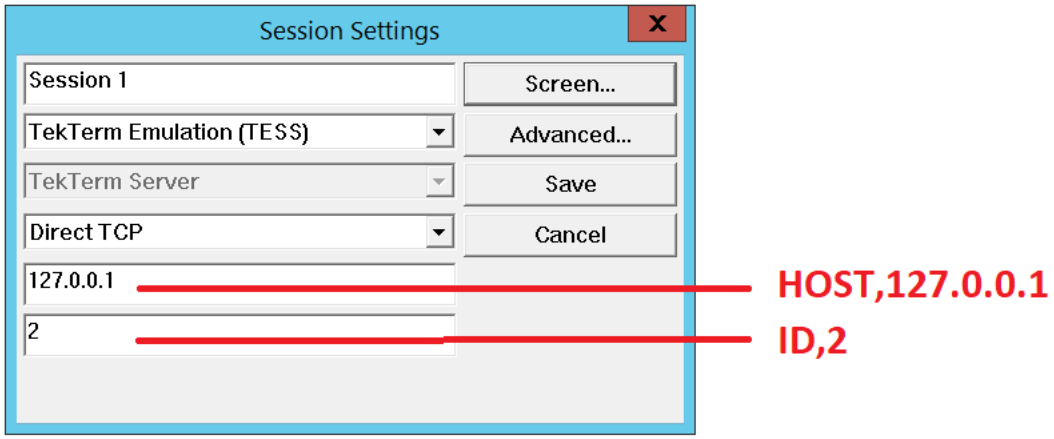
APPENDIX A – Scan to Configure, Barcode Samples

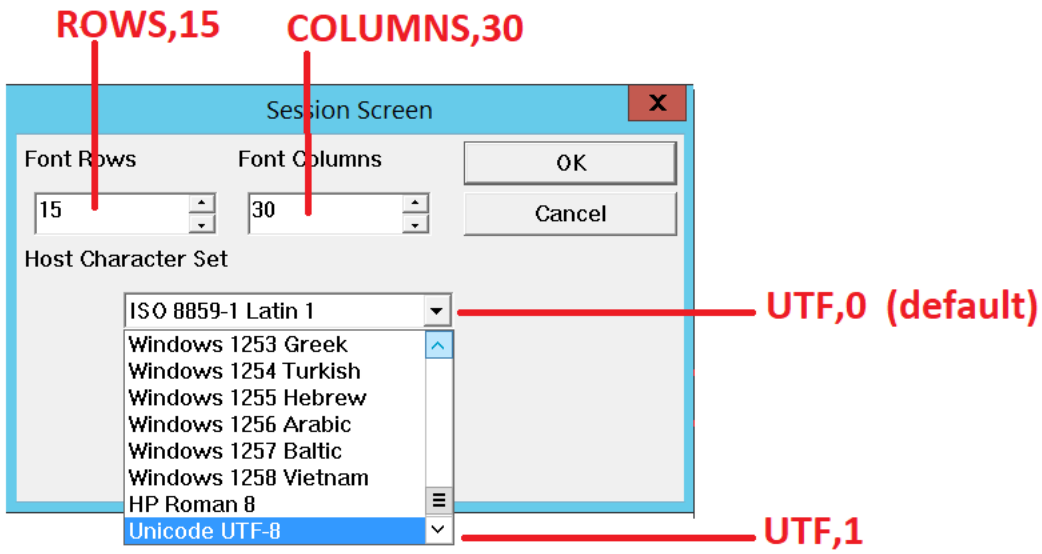
Example: to change the THEME to DARK MODE, scan the next 2 barcodes

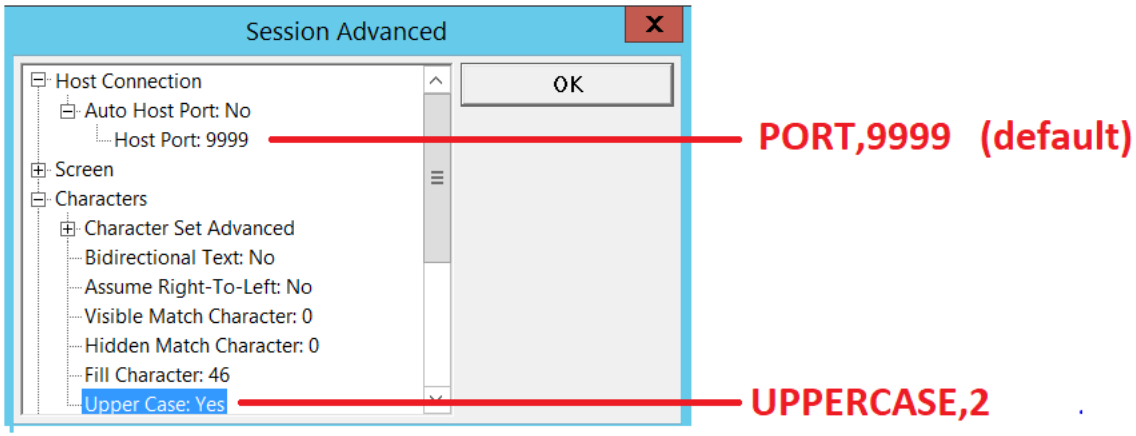
Generated using:

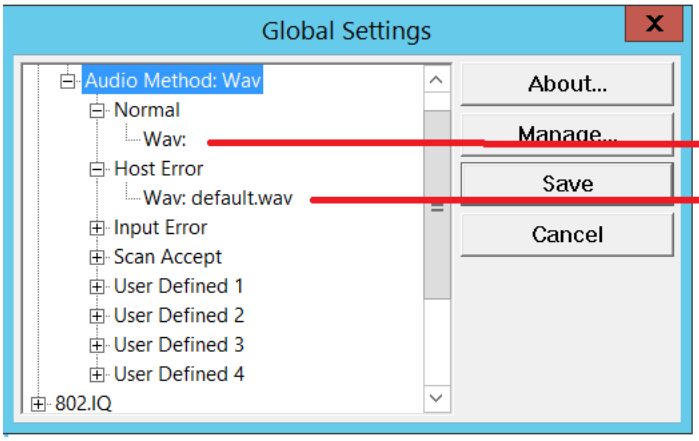
https://barcode.tec-it.com/en/Code128

APPENDIX B – TEKTERM 9 or 8 or 7 equivalents

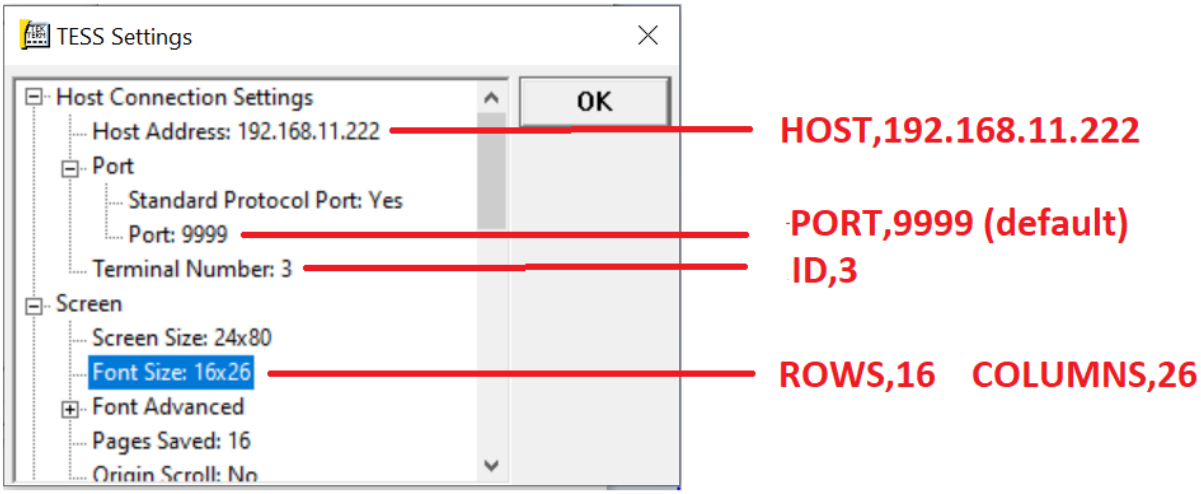


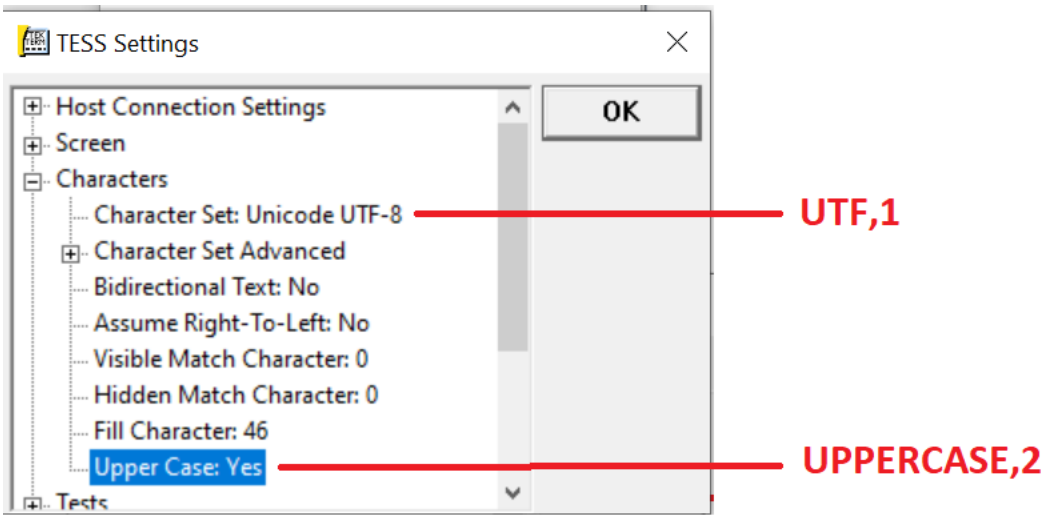


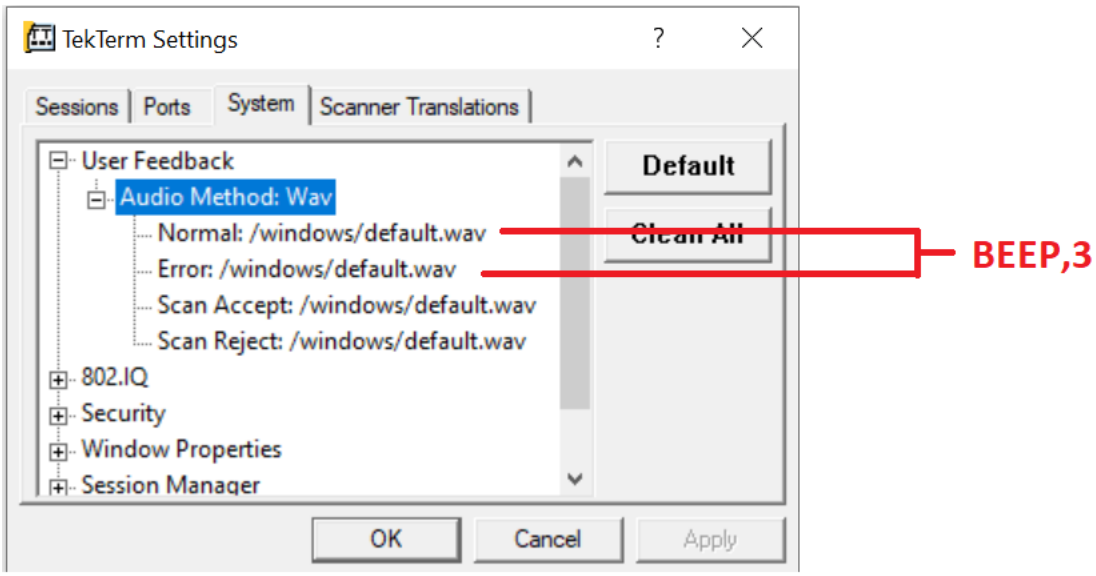



Global Settings
Audio Method: Wav
Normal
Wav:
Host Error
Wav: default.wav
Input Error
Scan Accept
User Defined 1
User Defined 2
User Defined 3
User Defined 4
802.IQ
About...
Manage...
Save
Cancel
BEEP,1

APPENDIX C – TEKTERM 5 equivalents






TekTerm Settings
Sessions
Ports
System
Scanner Translations
User Feedback
Audio Method: Wav
Normal: /windows/default.wav
Error: /windows/default.wav
Scan Accept: /windows/default.wav
Scan Reject: /windows/default.wav
802.IQ
Security
Window Properties
Session Manager
Default
Clean All
OK
Cancel
Apply
BEEP,3

APPENDIX D – Features Discontinued in Version 9

Speech Recognition

SMITERM will accept speech input using Google's speech recognition. This is activated by pressing the "Voice" button on the "button bar". This will cause the edges of the screen to go yellow. Spoken Data will be processed continuously until the Speech Recognizer times-out, or the Voice button is pressed again.

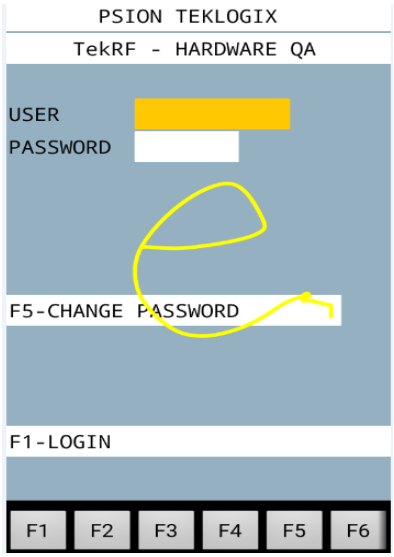
Text to Speech

Existing or New TEKRF or TEKCONSOLE transactions can also be enhanced to use the built in TTS (Text to Speech) feature. This allows prompts to be spoken to the user. (refer to section: Designing Transactions For SMITERM)

Gestures

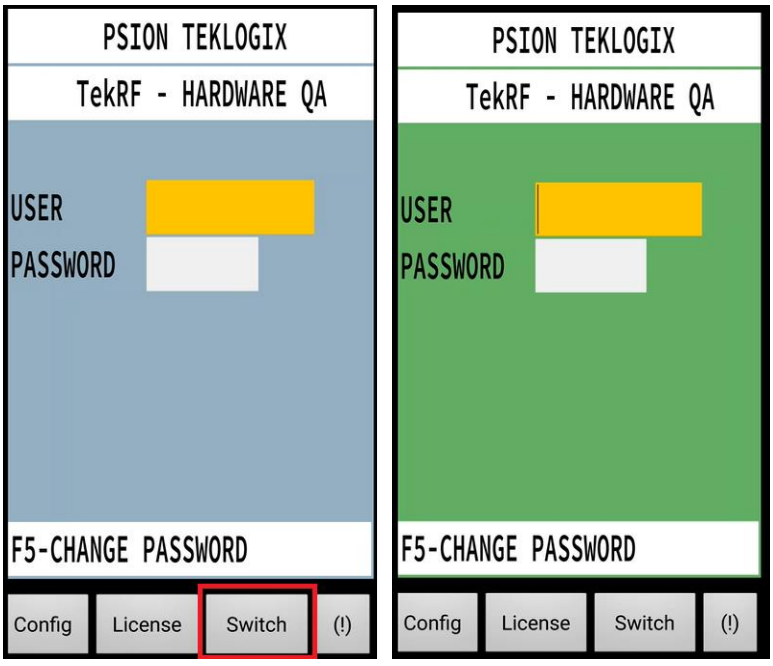
Gestures can be used to replace function key presses.

(example draw lower case ‘e’ to replace F4 exit



HOST Failover

HOST2, <value> , ID2 <value>, Theme2 <values>



End to End Encryption of Passwords

Any Hidden field, (a field that only displays * characters when data is entered) can be protected with SmiTerm's built-in Elliptical Curve Encryption. The Login Transaction will pre-fill this password field with a Public Key that is random generated each time it is login transaction is loaded. SmiTerm will randomly generate its own random Public Key and encrypt the password. It will send its Public Key + the encrypted password to the server during when it updates the password field.

"user1" with password "admin" will be send as below. (first 66 hex characters are the public key + 40 hex characters of encrypted data)

1RF16=45user1=6š03fe91fe1484800ca68079afe4db3357c506e905c1af50bdc6dbfb94a5252ac6d674e1b0ba132d9a34e6c126598a978b81bf7b577e

The a modified Login Transaction will then decrypt the password based on its private key, and the public key provided by the SmiTerm Client.

Printer Pass Ports

Printing output from TEKRF and TEKCONSOLE uses the TESS port pass command. The port can be redirected to a variety of devices.

Previous there were 6 Printer pass ports, now there will only be 2, as the additional ports were used to pass Text to Speech information and request Voice Recognition

Scan to Configure License key format

License can also be scanned in by creating a code 128 barcode with the following format

(scan prefix)**<**(license key)**>**

Example: **~<64D5434CDD8DC1C9>**

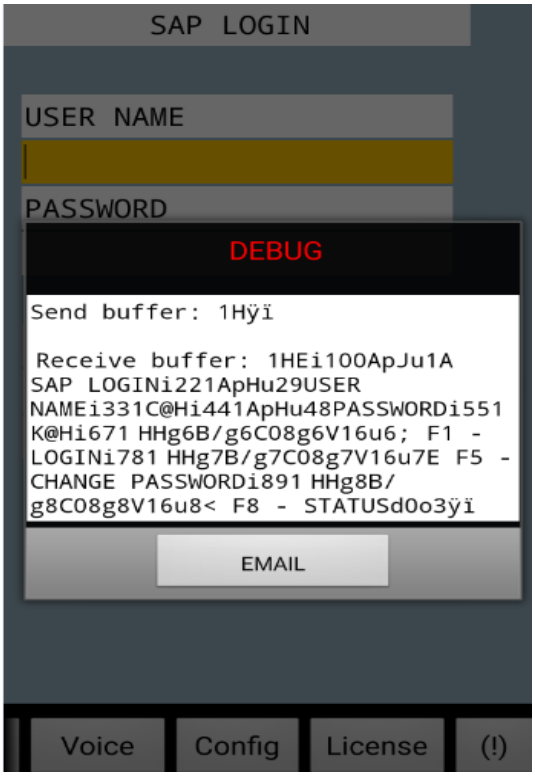
NOTE: all other scan to configure barcodes are supported

Fling Bar Location

Bar will always be at the bottom of the screen, The are new options to hide the Fling Bar.

Popup Debug

There is a button on the Debug pop-up that will send this information directly to support@smilog.ca if a mail application is installed on the Android Device.



NOTE: replaced with improved Debug View that includes a way to Export the debug file.

OCR (optical Character recognition) with Camera

Text Scanner options have been removed. The camera can still be used to scan barcodes

CAMERA, <value>

Where <value> = 0 to disable camera as scanner,

<value> = 1 to enable camera as barcode scanner,

<value> = 2 to enable camera as Text scanner,

<value> = 3 to enable camera as barcode and Text scanner,

APPENDIX E – New Features

Import and Export of Configuration

The user can now import and export configuration files (copies of smiConfig.txt).

The default location is the downloads directory.

Note: Google has changed the security on storage so you can no longer programmatically write files and that other applications can read. The only option is to call the File manager and let the user do this manually.

Export Debug Data

The user export he debug data. The default location is the downloads directory.

A new debug viewer is available if the DEBUG parameter is set to a value larger than Zero. This viewer includes the Export feature.

Improved Scanning from Camera.

You can use the camera to scan into any open field, including the License popup and the password popup. Suspending

Android dialog popups have been replaced with popups that use the same color and font as the Tekterm session.

Advisory popup and Hey-you popups will use the same color and font as the Tess session.

Compliant with current Playstore standards.

The application has been rebuilt to use the latest Android API and Standards.

The goal is to be able to publish this app in the Google Playstore in the future.

This required switching to AndroidX (which unfortunately increases the size of the APK file significantly).

Support for MDM applications

The application will support setting configuration parameters with MDM products like SOTI and Microsoft INTUNE.

There are still a number of security barriers to doing this, and often requires creating a unique namespace for the APK and uploading it through a Managed Playstore Account. We are hoping to simplify this process by making the App available on the Google Playstore.

Currently, we can push a copy to a Managed PlayStore account, if we are provided with the Organization ID

Fling Bar can now be hidden and will scroll within the view.

The fling bar is now part of the main view and can be scrolled above the popup keyboard

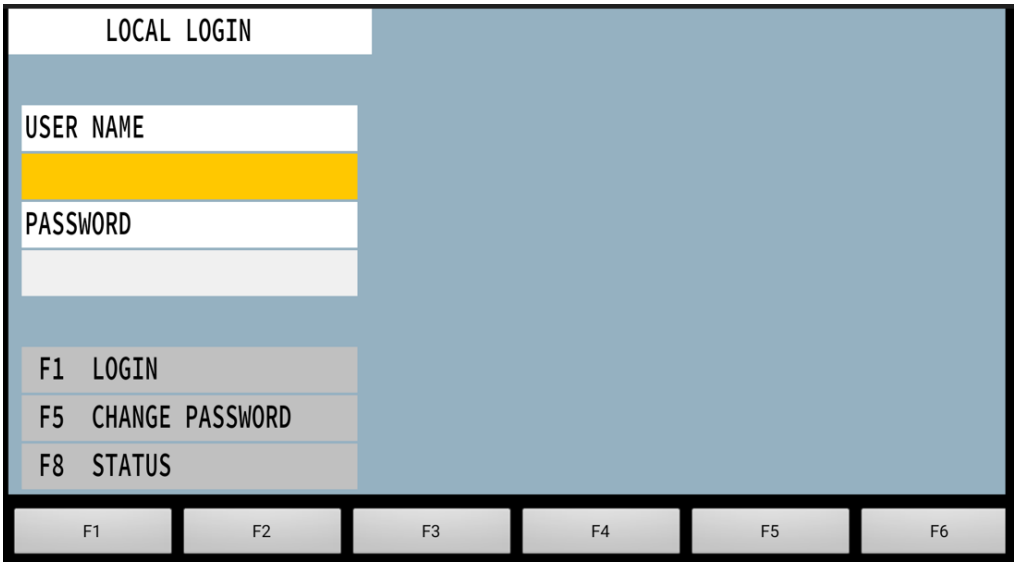
It can also be hidden from view and retrieved by scrolling the main view up.

This allows for a full screen view for devices that have a physical keyboard that includes easily accessible function keys.

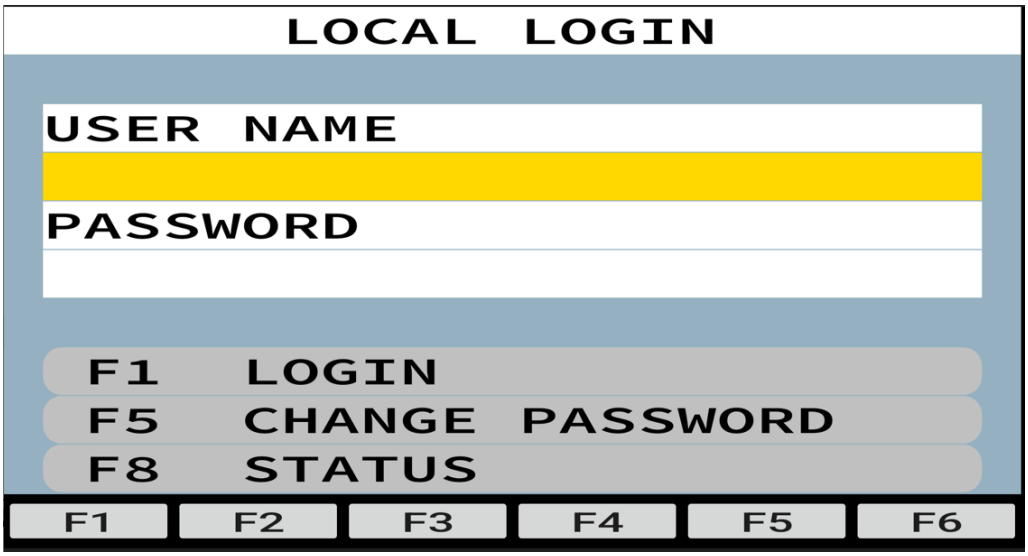
NOTE: this feature does not work correctly on older version of Android (below Android 9), Instead the Fling Bar still remains covered by the Popup keyboard.

Improved scaling for Landscape Mode

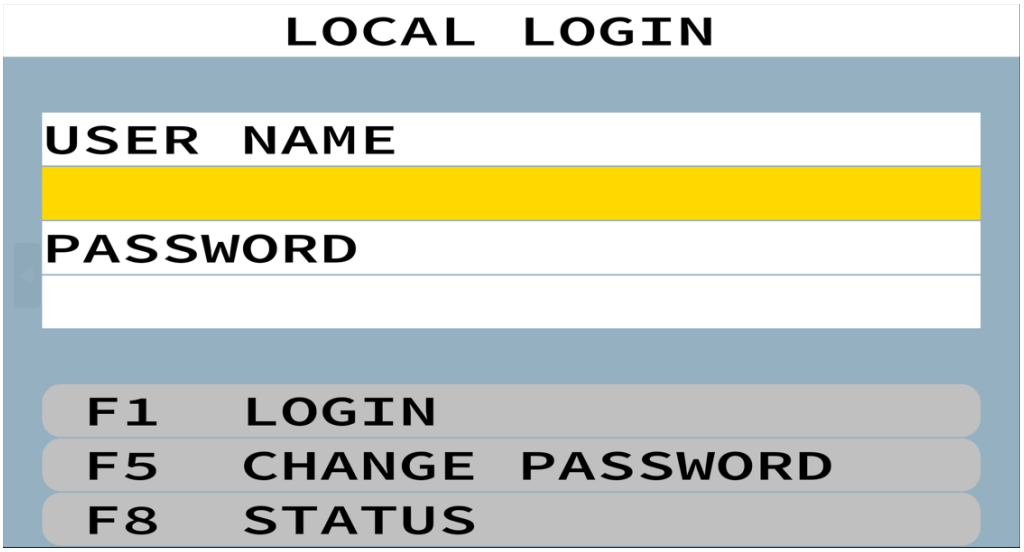
Previously, the original screen proportions were preserved, which moved the display to the far left



Now we scale to fill the screen.



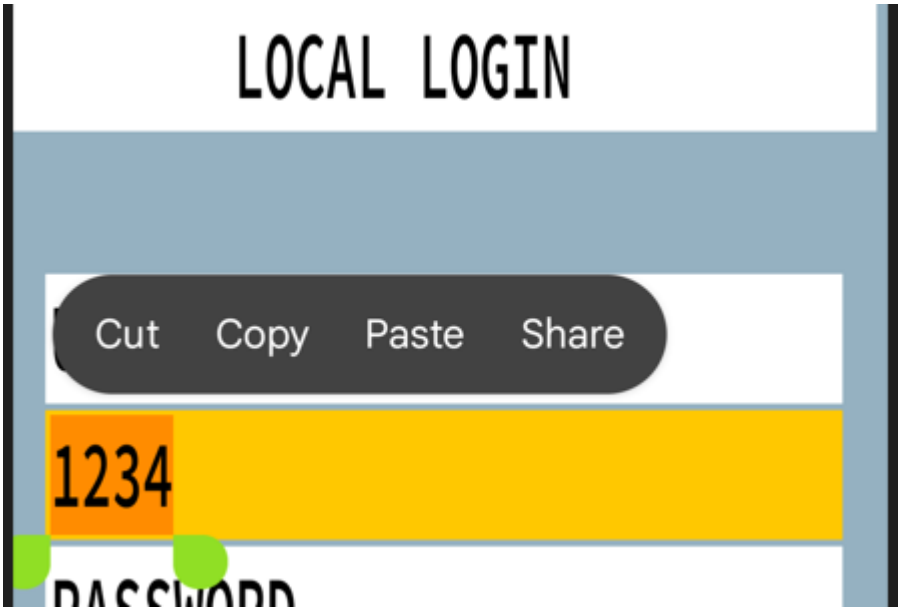
The screen can be expanded further if the Fling bar is hidden,



Remove all unwanted options on Action Bar.

Google continues to add features to the Action bar that is displayed when a field is edited.

Depending on the version of Android, this could include many unwanted options like Share, Translate, Dial phone number, search internet etc.



SmiTerm 9 removes all options except Cut, Copy, and Paste.

“Scan to Configure” supports 2D barcodes (CLONE)

The Scan to configure option scan be used to scan in the entire configuration using a 2D barcode.

The following barcode will load this configuration.

~<CLONE,HOST,portal.smilog.ca
HOST_LICENSE,49c755a7e0c0419d
ID,11
ROWS,10
COLUMNS,26
UPPERCASE,0
CAMERA,1
DEBUG_LEVEL,0
THEME,0
LOCALE,US
ORIENTATION,0
FULL_SCREEN,0>

Must scan WRITE barcode to complete

APPENDIX F - Changes in Functionality.

Same Popup Keyboard is used, regardless of the field type.

SmiTerm 9 will not switch keyboard layouts if focus is set to an Numeric only field.

This was done because often custom virtual keyboards are used that include function keys, tab keys, and arrow keys that are often not included on the default keyboard. These would disappear when the Numeric keyboard is displayed.

Changes to Open Field.

Previous versions of SmiTerm always unlocked the terminal and attempted to place the cursor in an open field after all the TESS data was processed. If the field requested by the ‘o’ open command was not available, it would search for the next open field.

In SmiTerm 9, the terminal will only unlock if an ‘o’ open, or a ‘h’ hey-you command or ‘a’ advisory command has been received. This more closely resembles what is done on TekTerm Devices.

If the requested field cannot be opened, then a search is done for the next open field.

Important Note:

The search for next open field has always been problematic.

The search strategy can be different depending on the device and configuration.

Good coding practices can eliminate this problem, where the Cursor position is always set to a specific location after an event in the code, and does not depend on the terminal deciding where to place the cursor next.

In TekTerm, Setting field order to N is recommended, but often this is not always done.

The search begins at the cursor position in later versions of TekTerm (but only if Field order is set to N) but from the top of the screen in others emulators.

TEKTERM 5	**field # order (Set to No) Next field after cursor. (Set to Yes) first field**
TEKTERM 9	**field # order (Set to No) Next field after cursor. (Set to Yes) first field**
TEKTELNET	**(Always) Same field**
TEKGUI	**(Always) first field**
WINTEKTERM	**field # order (Set to No) first field. (Set to Yes) first field.**
SMITERM 5	**(Always) Same field**
SMITERM 7 & 8	**(Always) Next field after cursor**

After o/ (open -1)

TEKTERM 5	**advisory = same field, heyyou = first field**
TEKTERM 9	**advisory = same field, heyyou = first field**
TEKTELNET	**advisory = same field, heyyou = same field**
TEKGUI	**advisory = first field, heyyou = first field**
WINTEKTERM	**advisory = same field, heyyou = first field**
SMITERM 5	**advisory = same field, heyyou = same field**
SMITERM 7 & 8	**advisor = same field, heyyou = same field**

Additional TESS commands Supported.

SmiTerm 9 now support the following TESS commands. These were ignored in previous version of SmiTerm.

These should not affect TEKRF and TEKCONSOLE users, as these commands are not used. These are aimed at other solutions that want to using SmiTerm in place of TekTerm.

‘z’ command, - abort and reset terminal

‘@’ command, - move cursor to specific field

‘r’ command – read the value in a specific field.