



DATREND
Systems Inc.

vPad-XSCTM

**Automation Interface
for 454A ESU Analyzer**

User Manual

vPad-XSC™
Automation Interface
for 454A ESU Analyzer
User Manual

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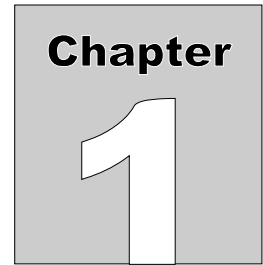
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Table of Contents

TABLE OF CONTENTS	V
1 OVERVIEW	1
1.1 Standard Accessories	1
1.2 Optional Accessories	1
1.3 Checklists and vPL	2
2 CONNECTION AND SETUP	3
3 CHECKLIST PROGRAMMING	5
3.1 Initialization	5
3.2 Configuration	6
3.2.1 Setting Limits and Tolerances	6
3.2.1.1 Example 1: Setting an ESU Power Limit	8
3.2.1.2 Example 2: Setting an ESU Current Limit	8
3.2.1.3 Example 3: Setting ESU Voltage Limit	9
3.2.1.4 Example 4: Setting ESU Crest Factor Limit	9
3.2.1.5 Example 5: Setting an ESU RF Leakage Limit	10
3.2.1.6 Example 6: Disabling a Limit	10
3.2.2 Resetting Limits to Defaults	11
3.2.3 Setting Load Values and Special Test Conditions	12
3.2.3.1 Example 1: Setting Load for ESU Power Test	12
3.2.3.2 Example 2: Setting Load for ESU RF Leakage Test	12
3.2.3.3 Example 3: Setting Load Conditions for RF Leakage Test	12
3.3 ESU Output Tests	13
3.3.1 ESU Output Tests	13
3.3.1.1 Example 1: ESU Power Test	14
3.3.1.2 Example 2: ESU Current Test	16
3.3.1.3 Example 3: ESU Voltage Test	17
3.3.1.4 Example 4: ESU Crest Factor Test	17
3.3.1.5 Example 5: ESU Combined Test: Power, Current, Voltage, CF	18
3.3.1.6 Example 6: ESU RF Leakage Test	18
3.3.1.7 Example 7: ESU Current Test with External Load	19
3.4 Direct Commands	20
4 APPENDIX A - VPL PROCEDURES	22
5 CALIBRATION AND MAINTENANCE	26



1 Overview

vPad-XSC™ for **454A** (referred to as "*the Interface*" in this manual) is an intelligent hardware interface which supports vPad electrical safety analyzers having the vPad-Check™ software application (App) installed. The Interface allows vPad-Check to conduct automated maintenance and inspection sequences on electrosurgical generators using the **454A** analyzer.

In addition to automated control of **454A** operation, the vPad-XSC provides automatic assessment of measurement results based on user-defined limits

This manual provides guidance for users integrating vPad-Check™ and vPad-XSC™ for **454A** into new and existing maintenance processes.

1.1 Standard Accessories

- XSC Interface unit (P/N 7400-109 or 7400-110)
- RJ-12 cable (P/N 3140-069) for connection to XBUS of vPad safety analyzer
- User Manual (P/N 6100-023)

1.2 Optional Accessories

- DB9F to DB25F null modem cable (P/N 3140-442) for connection to **454A** (Assman AK124-3-R)

For a complete list of available accessories, visit www.datrend.com or contact Datrend Customer Service (see Chapter 5 for contact details)

1.3 Checklists and vPL

In vPad-Check, equipment maintenance and inspection procedures are called **Checklists**. A Checklist can contain a sequence of prompts for the operator as well as machine instructions to configure the vPad safety analyzer and to conduct other tests through a remote instrument. In this case, the remote instrument is a **454A ESU** analyzer.

In a Checklist, prompts and machine instructions are written as statements in **vPad Programming Language** (vPL). A statement generally consists of a specific keyword followed by one or more parameters. For example, the statement

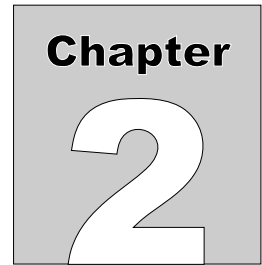
```
xopen "454A XSC" | E | 3
```

initializes a data connection between the Interface and **454A** using the keyword “**xopen**”. Other statements are responsible for configuring and initiating tests through **454A**.

Checklists can be written on the Android tablet, or on a personal computer (PC), using a text editor, or using the Datrend vPad-IDE. Once a new Checklist has been written, it can be imported to vPad-Check through a USB flash drive, via Bluetooth or a cloud service (Dropbox, Google Drive or OneDrive). Further information on Checklists and vPL, including a full list of vPL keywords, is provided in the **vPad-**

Check Operating Manual which can be opened with the Datrend Docs app:





2 Connection and Setup

Verify DIP switches on the Interface unit are set appropriately for your application: for a wired setup, DIP switch 3 is set to the **OFF** position, switches 1 & 2 are **ON**.

For a wired setup, connect the DB9 serial port of the Interface to the DB25 serial port of **454A** using the optional null modem serial cable (P/N 3140-442). A Bluetooth wireless setup is not recommended with **454A**.

Connect the XBUS port on the Interface to the XBUS port on the vPad safety analyzer using the RJ12 cable (P/N 3140-069) provided with the Interface. Note that the two XBUS ports on the Interface are interchangeable. This enables several vPad-XSC interfaces of different types to be chained in series if necessary.

Power up **454A** and wait for the main menu screen.

Once connected to the vPad safety analyzer, the “Power” indicator on the Interface should light up to show that it is now ready for operation.

3 Checklist Programming

A Checklist contains operator prompts and machine instructions for conducting an automated maintenance and inspection sequence. To create or edit a Checklist (with a *.vpl* extension), you may use any text editor that works with plain text (*.txt*) files, or use the Datrend API program vPad-IDE. Sample Checklists to control **454A** through the Interface are provided with the vPad-Check installation, with printed versions in the Appendix.

A Checklist that controls **454A** may consist of at least three types of instructions: initialization, configuration, and test.

3.1 Initialization

Before attempting to send commands to **454A**, a Checklist must first initialize the connection. For example, the vPL statement

```
xopen" 454A XSC" | E | 3
```

causes the Interface to attempt handshaking with **454A**. The character **"E"** in uppercase is an identifier which represents the vPad-XSC™ for **454A**; the **"E"** is mandatory and enables vPad-Check to address commands to the **454A** Interface specifically. The value **"3"** sets a delay time in seconds, after which the data connection is checked before proceeding with subsequent Checklist steps; this value can be reduced to **"2"** if a wired connection is in use. **"454A XSC"** is simply a description of the device under control by the Interface and this may be modified to a different description, if desired. For a complete explanation of the **"xopen"** statement, refer to the **vPad-Check Operating Manual**.

When vPad-Check encounters this statement, it will interrogate the Interface and notify the operator whether initialization was successful. If handshaking succeeds, the "Online" indicator will light up on the Interface unit. If not, the operator should verify connections and power, then retry the initialization.

3.2 Configuration

As an optional function, the Interface has the ability to automatically assign a pass/fail result for measurement data obtained from **454A**. Configuration statements can set limits for automatic pass/fail assessment, as well as to change **454A** settings for electrosurgical generator tests. In a Checklist, pass/fail limits and **454A** settings are configured with "**xctrl**" statements. For more information on the "**xctrl**" statement, refer to the **vPad-Check Operating Manual**.

3.2.1 Setting Limits and Tolerances

The Interface supports the following **454A** test functions:

- ESU power
- ESU current
- ESU voltage
- ESU crest factor
- ESU power/current/voltage/crest factor
- ESU leakage current, Active or Dispersive lead, lead Open or Closed
- ESU current through external load

When automatically assigning a pass or fail, each test utilizes one or more pass/fail limits which are stored in the Interface's memory. Limits are initialized to default values when power is applied to the Interface, but may be modified through the "**lim**" command. Modified limit settings do not persist once the Interface is disconnected from the vPad safety analyzer, or the safety analyzer is powered off. Limits are set as required during Checklist runtime.

Limit configuration statements in vPL are of the form

```
xctrl"< info >" | lim< id >,< type >,< p1 >,< p2 >
```

where:

- < **info** > is a description of the limit setting, which is briefly displayed to the user
- < **id** > is an ID number (1, 2, 3...) representing the limit to be set,
- < **type** > is the type of limit, such as a target with % tolerance or a min/max range,
- < **p1** > is the first pass/fail threshold, the effect of which depends on limit type, and
- < **p2** > is a second pass/fail threshold which, again, depends on limit type.

Table 1 lists the permitted values for the “lim” command. Additionally, any limit type can be set to “none”, which disables automatic assessment for the affected test types. If the Interface receives a limit configuration command with a disallowed limit type, that particular limit will be disabled.

Note that the units of measurement are assumed when specifying a limit value.

Table 3-1: Allowable limit ID and values for the xctrl lim command.

lim <limit_ID>, <limit_type>, <param_1>, <param_2>				
Limit Description	Allowable Values			
esu_power	1	target	0 - 100	percent
		target	0 - 600	units (W)
		min	0 W	
		max		600 W
		range	0 W	600 W
esu_current	2	target	0 - 100	percent
		target	0 - 9999	units (mA)
		min	0 mA	
		max		600 mA
		range	0 mA	600 mA
esu_voltage	3	target	0 - 100	percent
		target	0 - 9.99	units (kV)
		min	0 kV	
		max		9.99 kV
		range	0 kV	9.99 kV
esu_crest_factor	4	target	0 - 100	percent
		target	0 - 9.99	units (none)
		min	0	
		max		9.99
		range	0	9.99

esu_rf_leakage	5	target	0 - 100	percent
		target	0 - 9999	units (mA)
		min	0 mA	
		max		9999 mA
		range	0 kV	9999 mA
esu_am_current	6	target	0 - 100	percent
		target	0 - 9999	units (mA)
		min	0 mA	
		max		9999 mA
		range	0 kV	9999 mA

3.2.1.1 Example 1: Setting an ESU Power Limit

To illustrate how the **"lim"** command is used, consider following statement:

```
xctrl "Setting ESU power tol. to 10%" | lim1,target,10,percent
```

For this statement,

- 1** immediately following the **"lim"** command specifies the limit is for esu power;
- target** specifies the limit type as a target with tolerance, as opposed to a min, max or range;
- 10** is the tolerance value (**±10**); and
- percent** sets the tolerance type as a percentage, as opposed to a number of joules (**units**).

Note that the **"target"** value referred to above is not included with the limit, but is specified in the vPL statement that executes the energy measurement itself.

3.2.1.2 Example 2: Setting an ESU Current Limit

In this next example, the vPL statement sets the ESU current limit to a maximum of 80 mA:

```
xctrl "Setting current limit to max. 80 mA" | lim2,max,80
```

For this statement,

2 immediately following the "**lim**" command specifies the limit is for current;
max specifies limit type as maximum
80 is the maximum value (80 mA)

Limits persist until modified by a "**xctrl**" statement.

3.2.1.3 Example 3: Setting ESU Voltage Limit

The following vPL statement sets an ESU Voltage limit to a range with tolerance in kV (**x.xxx kV**):

```
xctrl "Setting Voltage range 0.1 kV to 2.50 kV" | lim3,range,0.1,2.5
```

For this statement,

3 immediately following the "**lim**" command specifies the limit is for pacer current;
range specifies the limit type as a range;
0.1 is the minimum value (0.1 kV); and
2.5 is the maximum value (2.5 kV).

No target is needed for range limits. Measurement results are automatically assessed as long as limit is not set to "none".

3.2.1.4 Example 4: Setting ESU Crest Factor Limit

The following vPL statement sets an ESU Crest Factor limit to a maximum of 2.55 (**x.xxx**):

```
xctrl "Setting Crest Factor limit: max 2.55" | lim4,max,2.55
```

For this statement,

4 immediately following the "**lim**" command specifies the limit is for pacer sensitivity;
max sets limit type as maximum;
2.55 is the minimum value

3.2.1.5 Example 5: Setting an ESU RF Leakage Limit

The following vPL statement sets an ESU RF Leakage limit:

```
xctrl "Setting ESU RF Leakage tol. to 50 mA" | lim5,target,50,mA
```

For this statement,

- 5** immediately following the "**lim**" command specifies the limit is for esu power;
- target** specifies the limit type as a target with tolerance, as opposed to a min, max or range;
- 50** is the tolerance value (**±50 mA**); and
- mA** sets the tolerance type as units (**mA**), as opposed to a percentage.

Note that the "**target**" value referred to above is not included with the limit, but is specified in the vPL statement that executes the energy measurement itself.

3.2.1.6 Example 6: Disabling a Limit

Sometimes automatic assessment may not be desirable, in which case the following vPL statement can be used to disable a particular limit. For example:

```
xctrl "Disabling crest factor limit" | lim4,none
```

For this statement,

- 4** immediately following the "**lim**" command specifies the limit is for crest factor;
- none** sets the limit to "**none**", disabling automatic pass/fail. Other parameters of the command are omitted because they are not necessary.

Once a limit has been disabled, a target specified in a "**xtest**" statement will appear in the Test Record, but the corresponding measurement value will not be passed or failed automatically.

3.2.2 Resetting Limits to Defaults

The following vPL statement resets all limit settings to defaults:

```
xctrl "< info >" | rslm
```

where:

< *info* > is a descriptive message which is briefly displayed to the user.

Table 2 lists the limit default values, which are assigned at power-on of the Interface, or in response to the "rslm" command as above.

TABLE 2: Default Limit Settings

TEST LIMIT	ID	DEFAULT VALUES		
		LIMIT TYPE	PARAMETER 1	PARAMETER 2
esu power	1	target	± 10 %	percent
esu current	2	target	± 10 %	percent
esu voltage	3	target	± 10 %	percent
esu crestfactor	4	target	± 10 %	percent
esu rf leakage	5	target	± 10 %	percent
esu external load current	6	target	± 10 %	percent

3.2.3 Setting Load Values and Special Test Conditions

Prior to performing a test, the load value must be selected

3.2.3.1 Example 1: Setting Load for ESU Power Test

The load for a basic power test can be set to a value between 50 and 1500 ohms, in 50 ohm increments. The load is set using the control command:

```
xctrl <text> | SETLOAD:<value> | <display time>
xctrl "Set output load to 1000." | SETLOAD:1000 | 3
```

where:

< text > is text describing what is happening, displayed to the user;
< value > is the resistive load value required for the test; and
< display time > is the time the <text> will remain on the display (recommended value 2 or more)

3.2.3.2 Example 2: Setting Load for ESU RF Leakage Test

The load for a RF Leakage test can be set to a value between 50 and 1500 ohms, in 50 ohm increments. The load is set using the control command:

```
xctrl <text> | SETRFL:<value> | <display time>
xctrl "Set RFL output load to 200." | SETLOAD:200 | 2
```

where:

< text > is text describing what is happening, displayed to the user;
< value > is the resistive load value required for the test; and
< display time > is the time the <text> will remain on the display (recommended value 2 or more)

3.2.3.3 Example 3: Setting Load Conditions for RF Leakage Test

The load for a RF Leakage test can be set to be connected across the Active to Dispersive lead connections, or floating (disconnected). The condition is set using the control command:

```
xctrl <text> | SETRFL:<value> | <display time>
xctrl "Set leakage load to OPEN." | SETRFL:0 | 2 or;
```

```
xctrl "Set leakage load to CLOSED." | SETRFL:C | 2
```

where:

< **text** > is text describing what is happening, displayed to the user;
< **value** > is the load connection required for the test, either **O** or **C**; and
< **display time** > is the time the <**text**> will remain on the display (recommended value 2 or more)

The load for a RF Leakage test can be set to measure at the Active or Dispersive lead. The condition is set using the control command:

```
xctrl <text> | SETELEC:<value> | <display time>  
xctrl "Set Electrode to ACTIVE." | SETELEC:A | 2 or;  
xctrl "Set Electrode to DISPERSIVE." | SETELEC:D | 2
```

where:

< **text** > is text describing what is happening, displayed to the user;
< **value** > is the electrode required for the test, either **A** or **D**; and
< **display time** > is the time the <**text**> will remain on the display (recommended value 2 or more)

3.3 ESU Output Tests

3.3.1 ESU Output Tests

vPL statements that initiate esu output test measurements are of the form

```
xtest "text" | GETDATA:<mode> | < display time >
```

where:

< **text** > is text describing what is happening, displayed to the user; and
< **mode** > what particular parameter(s) shall be measured.
< **display time** > is the time the <**text**> will remain on the display (recommended value 2 or more)

Prior to performing any test, the limits should be set and the test load specified. Limits can be set at the beginning of the Procedure, or just before the test is performed.

3.3.1.1 Example 1: ESU Power Test

The following vPL statement performs an esu power test:

```
xtest  "ESU Setting 10W (Power):\n\nActivate ESU until\nEXITMODE\nnis indicated on display" | GETDATA:P25 | 10
```

For this statement,

- <text>** is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n's** are CR\LF and are used to control the vertical position of text on the display for easier reading.
- P25** is the **<mode>**, in this case for power. Note that the default limits set for power are based on a target value with a **+ \- 10 %** range. **P25** indicates a power measurement with a target of **25W**.
- 10** is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **P**. If a target is specified, it will be ignored.

Note: When the **454** is ready to make a power measurement a message (**RDPOWER**) will be displayed in the lower left corner of the LCD display and the measurements on the display will be 0000's. When the ESU is activated, by footswitch or pencil, measurement values will be shown on the display. After several seconds, the message will change to **EXITMODE**, indicating the test is complete and the activating device can be released to turn off the esu power output. The data will then be returned to the controlling VPL Procedure.

Depending on the measurement being made, the message displayed on the LCD will change (**RDCURRENT, RDVOLTAGE, etc.**)

For 2 of the measurements (**RDRFLEAKAGE, RDAMMETER**) the **454** may terminate the measurement automatically and return the measurement data.

When the data is returned to the VPL Procedure controlling the test, it will contain a message: **PASS, FAIL** or Indeterminate, causing the VPL Procedure to display:

a) **PASS**: the screen will display the measurements and the limit conditions for the parameter. The status (**PASS**) will also be displayed in green. The measurements will be displayed for the number of seconds indicated in the xtest statement, with a countdown timer displayed at the top of the screen. When the timer reaches zero, the Procedure will advance to the next statement in the VPL Procedure.



b) **FAIL**: the screen will display the measurements and the limit conditions for the parameter. The status (**FAIL**) will also be displayed in red. To move forward in the Procedure the user must acknowledge the **FAIL** status by touching the **Next Step** button on the screen.



c) Indeterminate: the screen will display the measurements and the limit conditions for the parameter. One or more limit condition is not defined (shows ----) which means the status can not be determined automatically. In this case, the user must assign a **PASS** or **FAIL** to the test by pressing the appropriate button on the screen.



3.3.1.2 Example 2: ESU Current Test

The following vPL statement performs an esu current test:

```
xtest  "ESU Setting 10W (Current):\n\nActivate ESU until\nEXITMODE\nis indicated on display" | GETDATA:I70 | 5
```

For this statement,

<text> is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n's** are CR\LF and are used to control the vertical position of text on the display for easier reading.

I70 is the **<mode>**, in this case for power. Note that the default limits set for current are based on a target value with a **+/- 10 %** range. **I70** indicates a current measurement with a target of **70mA**.

5 is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **I**. If a target is specified, it will be ignored.

3.3.1.3 Example 3: ESU Voltage Test

The following vPL statement performs an esu voltage test:

```
xtest  "ESU Setting 10W (Voltage):\n\nActivate ESU until\nEXITMODE\nis indicated on display" | GETDATA:V0.5 | 3
```

For this statement,

- <text>** is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n`s** are CR\LF and are used to control the vertical position of text on the display for easier reading.
- V0.5** is the **<mode>**, in this case for power. Note that the default limits set for current are based on a target value with a **+|- 10 %** range. **V0.5** indicates a voltage measurement with a target of **0.5 kV**.
- 3** is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **V**. If a target is specified, it will be ignored.

3.3.1.4 Example 4: ESU Crest Factor Test

The following vPL statement performs an esu power test:

```
xtest  "ESU Setting 10W (CF):\n\nActivate ESU until\nEXITMODE\nis indicated on display" | GETDATA:F2 | 2
```

For this statement,

- <text>** is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n`s** are CR\LF and are used to control the vertical position of text on the display for easier reading.
- F2** is the **<mode>**, in this case for power. Note that the default limits set for crest factor are based on a target value with a **+|- 10 %** range. **F2** indicates a crest factor measurement with a target of **2**, note there are no units for crest factor.
- 2** is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **F**. If a target is specified, it will be ignored.

3.3.1.5 Example 5: ESU Combined Test: Power, Current, Voltage, CF

The following vPL statement performs an esu power test:

```
xtest  "ESU Setting 10W (ALL):\n\nActivate ESU until\n
        EXITMODE\nis indicated on display" | GETDATA:ALL10,70,, |
        2
```

For this statement,

<text> is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n`s** are CR\LF and are used to control the vertical position of text on the display for easier reading.

ALL10,70,, is the **<mode>**, in this case for power. Note that the default limits set for all parameters are based on a target value with a **+|- 10 %** range. **ALL10,70,,** indicates a power measurement with a target of **10W**, a current measurement with a target of **70mA**, and no targets for voltage or crest factor.

5 is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **ALL10,,,** would set a target for power, but not for the other parameters. If a min, max or range limit has been set for current, voltage and/or crest factor the limit will be tested.

3.3.1.6 Example 6: ESU RF Leakage Test

The following vPL statement performs an esu power test:

```
xtest  "ESU Setting 10W (RFL):\n\nActivate ESU until\n
        EXITMODE\nis indicated on display" | GETDATA:RFL | 5
```

For this statement,

<text> is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n`s** are CR\LF and are used to control the vertical position of text on the display for easier reading.

RFL is the **<mode>**, in this case for power. Note that the default limits set for current are based on a target value with a **+|- 10 %** range. **RFL100** would indicate a RF Leakage measurement with a target of **100mA**.

5 is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **RFL**. If a target is specified, it will be ignored.

3.3.1.7 Example 7: ESU Current Test with External Load

The following vPL statement performs a current test using the Current Loop connections with an external load:

```
xtest  "ESU Setting 10W (AM):\n\nActivate ESU until\nEXITMODE\nis indicated on display" | GETDATA:AM125 | 3
```

For this statement,

<text> is the information presented to the user in standard VPL format, according to the vPad-Check manual. The **\n`s** are CR\LF and are used to control the vertical position of text on the display for easier reading.

AM125 is the **<mode>**, in this case for power. Note that the default limits set for current are based on a target value with a **+|- 10 %** range. **AM125** indicates a current measurement with a target of **125mA**.

3 is the number of seconds the result will remain on the screen if the result is considered a **PASS**

If the limit is minimum, maximum or range (as set with a **xcntrl** command), no target is required, eg. **AM**. If a target is specified, it will be ignored.

3.4 Direct Commands

The interface box provides the flexibility to the VPL programmer to use the ‘normal’ **454A** remote control commands directly by putting a special token ‘#’ in front of a **454A** command, for example, **#GOTOLOCAL**.

Example:

```
xctrl "Go to LOCAL mode" | #GOTOLOCAL
```

There is, however, some limitations to the use of the direct commands. Basically, only control commands without any return data can be used this way. The interface box waits for a ‘*’ confirmation from the **454A** after sending the commands, then sends an acknowledgement to the vPad-check Procedure, and finishes the command execution. So for example, **RDMETER** or **RDCURRENT** can not be used as direct commands because they return something other than ‘*’.

For a detailed description of the vPL Procedure language, refer to **vPad-Check Operating Manual**.

4 Appendix A - VPL Procedures

The following are examples of VPL Procedures using the **454 XSC** interface

Example 1:

```
// File: FLUKE ESU TESTER 454A.vpl
// Date: 2018 Oct 30
//
// Version: 1.0
// Updated:
//
//
// Display Checklist title
// color #F8F880
prompt "Demo2: Fluke 454A ESU Tester\nRemote Control via XSC" | bold

// Setup instructions

// Initialize connection with XSC
xopen "Fluke 454A XSC" | E | 3

// Disable automatic assessment
// Pass/fail is by manual entry, based on displayed acceptance ranges
// (15% tolerance)
//xctrl "Disabling automatic PASS/FAIL..." | lim1,none,
//
//
//// Enable automatic assessment for power (15% tolerance)
xctrl "Setting power tolerance to 15% of target..." | lim1,target,15,percent | 2
xctrl "Setting Current tolerance to 20 to 85 mA" | lim2,range,20,85 | 2
//

xctrl "Set output load to 1000." | SETLOAD:1000 | 3

// The Current measurement has a target set to 10mA, but the limit is set to a range.
// The target is ignored unless the limit is set to a target type
xtest "ESU Setting 10W (Current):\n\nActivate ESU until\nEXITMODE\nis indicated on
display" | GETDATA:I10 | 10

// The Power measurement is set to a target of 10W, consistent with the limit type of
'target'
xtest "ESU Setting 10W (Power):\n\nActivate ESU until\nEXITMODE\nis indicated on display"
| GETDATA:P10 | 10
```


vPad-XSC for 454A USER MANUAL

```
// The Voltage target is set to 10kV which is way too high for this 10W test
xtest  "ESU Setting 10W (Voltage):\n\nActivate ESU until\nEXITMODE\nis indicated on
display" | GETDATA:V10 | 10

// Crest Factor limit type default is %, but no target, :F with no # is consistent
xtest  "ESU Setting 10W (CrestF):\n\nActivate ESU until\nEXITMODE\nis indicated on display"
| GETDATA:F | 10

xctrl  "Set leakage load to 200." | SETRFL:200 | 3
// sets the load to 200 ohms, Closed

xctrl  "Set leakage load to OPEN." | SETRFL:O | 3
// will actually negate the previous load setting and change to Open

xctrl  "Set Electrode to Active." | SETELEC:A | 3

// "Check RF leakage."
prompt "The load has been set to 200 for the RF Leakage test, the leakage is from the
Active Electrode"
// The leakage can be set to the Dispersive electrode using SETELECT:D
xtest  "ESU Setting 10W (RFL; 200; A ):\n\nActivate ESU until\nEXITMODE\nis indicated on
display" | GETDATA:RFL | 10

prompt "Set up to measure current through the Current Loop using an External Load"
// Could change the above 'prompt' to a 'show' statement and display an image of the correct
setup
xtest  "Check AM meter." | GETDATA:AM | 10

//
xtest  "Get all output data" | GETDATA:ALL1,,, | 10

xctrl  "Set Fluke 454A to local mode" | #GOTOLOCAL | 2

prompt "End of Fluke 454A demo"

// End of script
```

Example 2:

```
// File: FLUKE ESU TESTER 454A.vpl
// Date: 2018 Oct 30
//
// Version: 1.0
// Updated:
//
//
// Display Checklist title
// color #F8F880
prompt "Demo: Fluke 454A ESU Tester\nRemote Control via XSC" | bold

// Setup instructions

// Initialize connection with XSC
```

vPad-XSC for 454A USER MANUAL

```
xopen  "Fluke 454A XSC" | E | 3

//
//// Enable automatic assessments
xctrl  "Setting power tolerance to 0.6 W" | lim1,target,0.6,units | 2
xctrl  "Setting Current tolerance 20 to 85.5 mA" | lim2,range,20,85.2 | 2
xctrl  "Setting Voltage maximum 1.5 kV" | lim3,max,1.5 | 2
xctrl  "Setting Crest Factor maximum 3" | lim4,max,3 | 2
//

xctrl  "Set output load to 1000." | SETLOAD:1000 | 3

// Power target 10W, Current 70mA Voltage and Crest Factor have max limit setting, target
not applicable

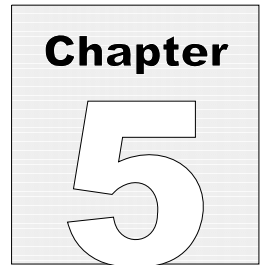
xtest  "ESU Setting 10W:\n\nActivate ESU until\nEXITMODE\nis indicated on display" |
GETDATA:ALL5.5,70,, | 4

// Power target 10W, Current 70mA, Voltage 0.24, Crest Factor 1.7
// xtest  "ESU Setting 10W:\n\nActivate ESU until\nEXITMODE\nis indicated on display" |
GETDATA:ALL5.5,70,0.24,1.7 | 4

xctrl  "End of Fluke 454A demo,\nreturning to local mode" | #GOTOLOCAL | 2

prompt "End of Fluke 454A demo"

// End of script
```

5 Calibration and Maintenance

Calibration of vPad-XSC for **454A** is not required.

For service assistance, contact Datrend for a Return Materials Authorization (RMA) number and the location of the nearest Service Facility.

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