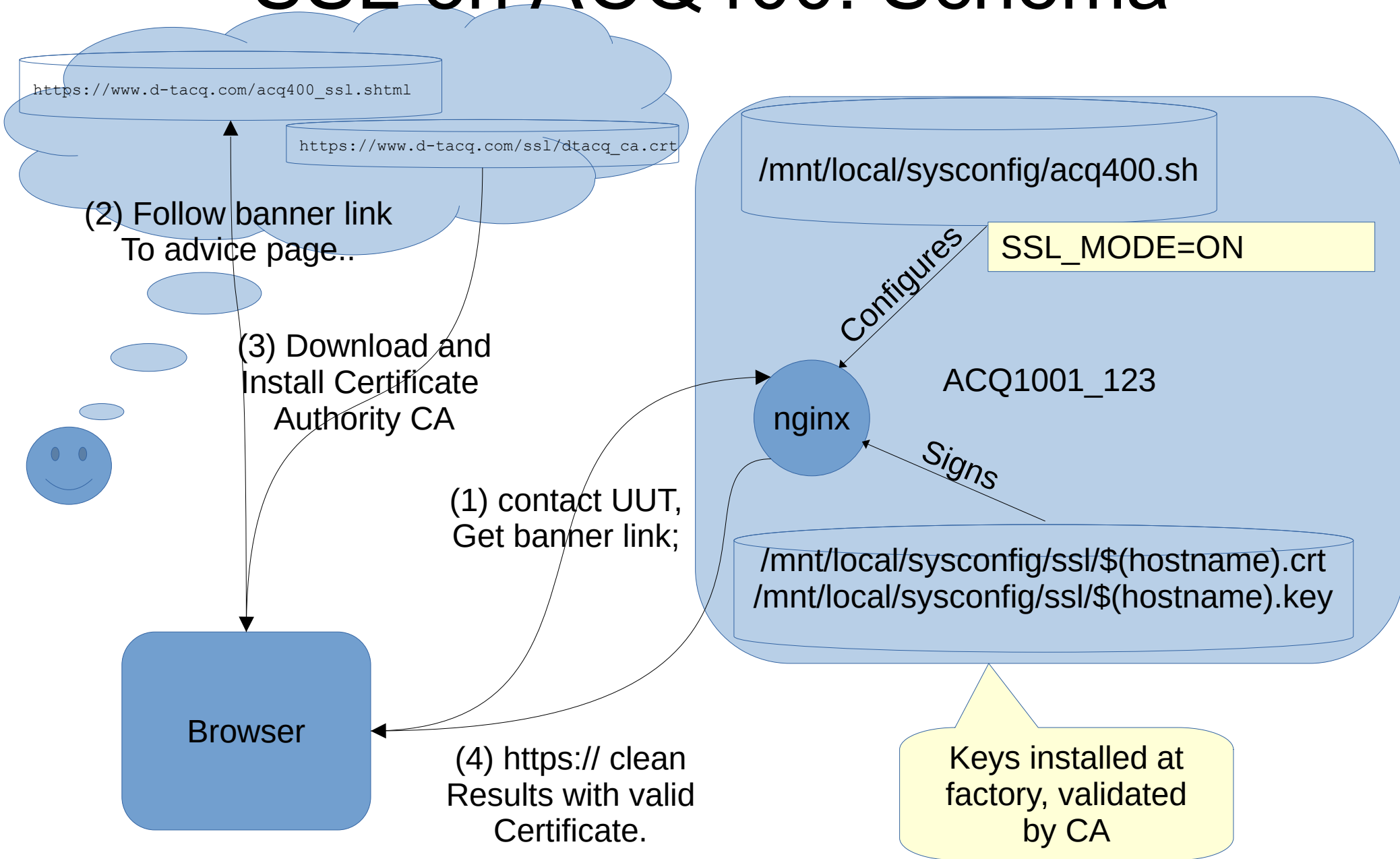


# ACQ400 Series Https

- From release 709, D-TACQ ACQ400 series product now supports https, secure SSL communication with the embedded website.
- The feature will ship with all new units from September 2024.
- Existing users are welcome to upgrade to use the feature. Please contact D-TACQ for appropriate certificates if this is required.

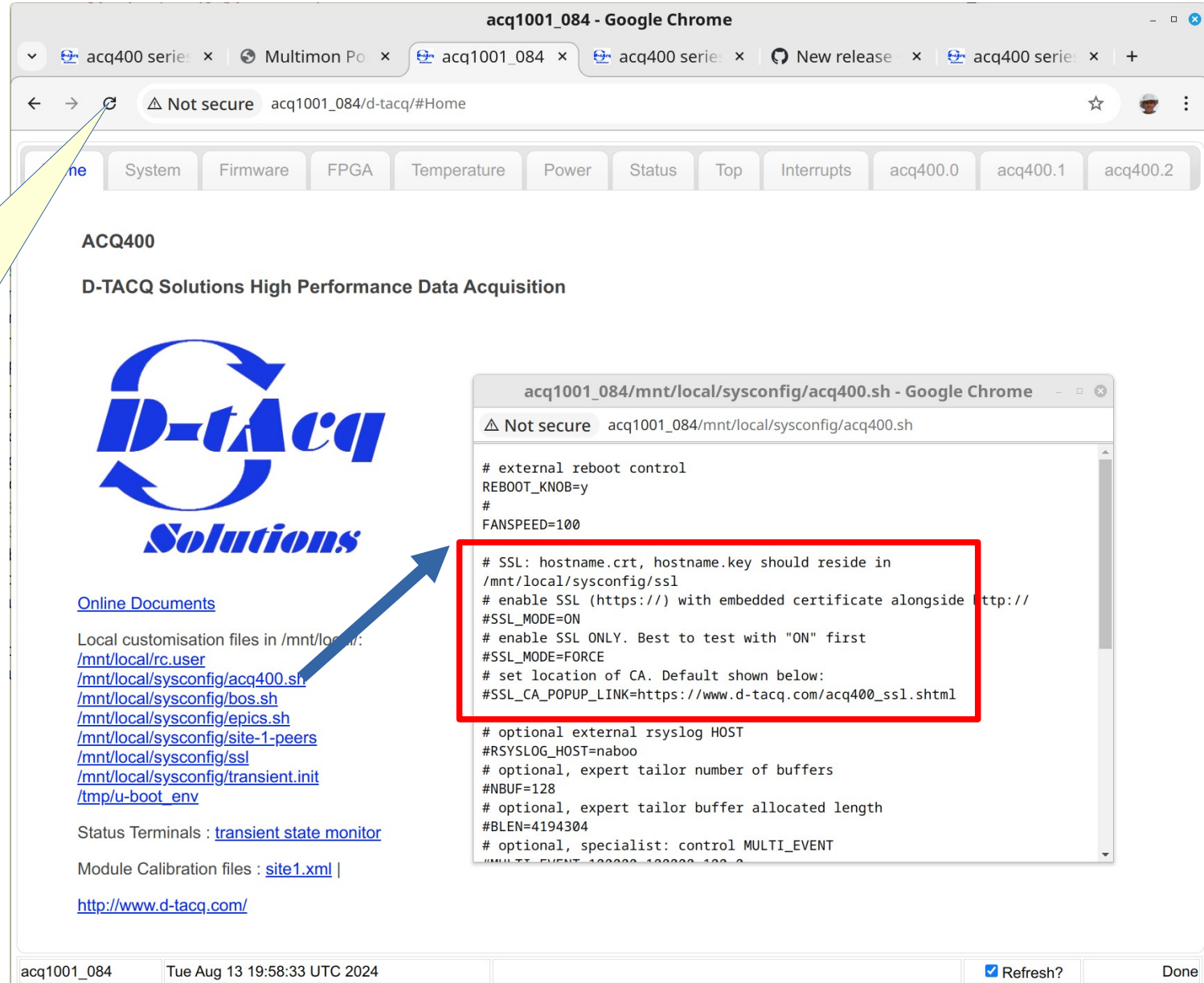
# SSL on ACQ400: Schema



# Default: no SSL

Status Quo Ante:

http:// only, "Not Secure Warning on modern browser



The screenshot shows a web browser window with the address bar displaying "Not secure" and the URL "acq1001\_084/d-tacq/#Home". The page content includes the D-TACQ Solutions logo and a list of local customisation files. A terminal window is open, showing the contents of the file "/mnt/local/sysconfig/acq400.sh". A red box highlights the SSL configuration section in the terminal output.

```
acq1001_084/mnt/local/sysconfig/acq400.sh - Google Chrome
△ Not secure acq1001_084/mnt/local/sysconfig/acq400.sh

# external reboot control
REBOOT_KNOB=y
#
FANSPEED=100

# SSL: hostname.crt, hostname.key should reside in
/mnt/local/sysconfig/ssl
# enable SSL (https://) with embedded certificate alongside http://
#SSL_MODE=ON
# enable SSL ONLY. Best to test with "ON" first
#SSL_MODE=FORCE
# set location of CA. Default shown below:
#SSL_CA_POPUP_LINK=https://www.d-tacq.com/acq400_ssl.shtml

# optional external rsyslog HOST
#RSYSLOG_HOST=naboo
# optional, expert tailor number of buffers
#NBUF=128
# optional, expert tailor buffer allocated length
#BLEN=4194304
# optional, specialist: control MULTI_EVENT
MULTI_EVENT=10000 10000 100 0
```

# Combined http:// and https://

Http:// works  
As before:

“Not Secure  
Warning on modern  
browser

Strapline  
Prompts user  
To install  
Certificate and  
Use https

It's possible to  
Use https://  
right away, subject  
to warnings:  
“Certificate invalid”

The screenshot shows a web browser window with the URL `acq1001_084/d-tacq/#Home`. The browser displays a "Not secure" warning. The main content area shows the D-TACQ Solutions logo and navigation tabs for Home, System, Firmware, FPGA, Temperature, Power, Status, Top, Interrupts, acq400.0, acq400.1, and acq400.2. Below the logo, there are links for Online Documents and Local customisation files. A terminal window is open, showing the configuration file `acq1001_084/mnt/local/sysconfig/acq400.sh`. The terminal content includes:

```
# external reboot control
REBOOT_KNOB=y
#
FANSPEED=100
#
# SSL: hostname.crt, hostname.key should reside in
# /mnt/local/sysconfig/ssl
# enable SSL (https://) with embedded certificate alongside http://
SSL_MODE=ON
# enable SSL ONLY. Best to test with 'ON' first
#SSL_MODE=FORCE
# set location of CA. Default shown below:
#SSL_CA_POPUP_LINK=https://www.d-tacq.com/acq400_ssl.shtml
# optional external rsyslog HOST
#RSYSLOG_HOST=naboo
# optional, expert tailor number of buffers
#NBUF=128
# optional, expert tailor buffer allocated length
#BLEN=4194304
# optional, specialist: control MULTI_EVENT
```

An arrow points from the terminal window to the "Local customisation files" section of the web page. At the bottom of the browser window, a message states "SSL is available" and "Install Certificate and go to https". The browser status bar shows "Tue Aug 13 20:03:27 UTC 2024" and "Refresh? Done".

# Installing the D-TACQ CA

ACQ400 website not yet Secure

D-TACQ website is Secure

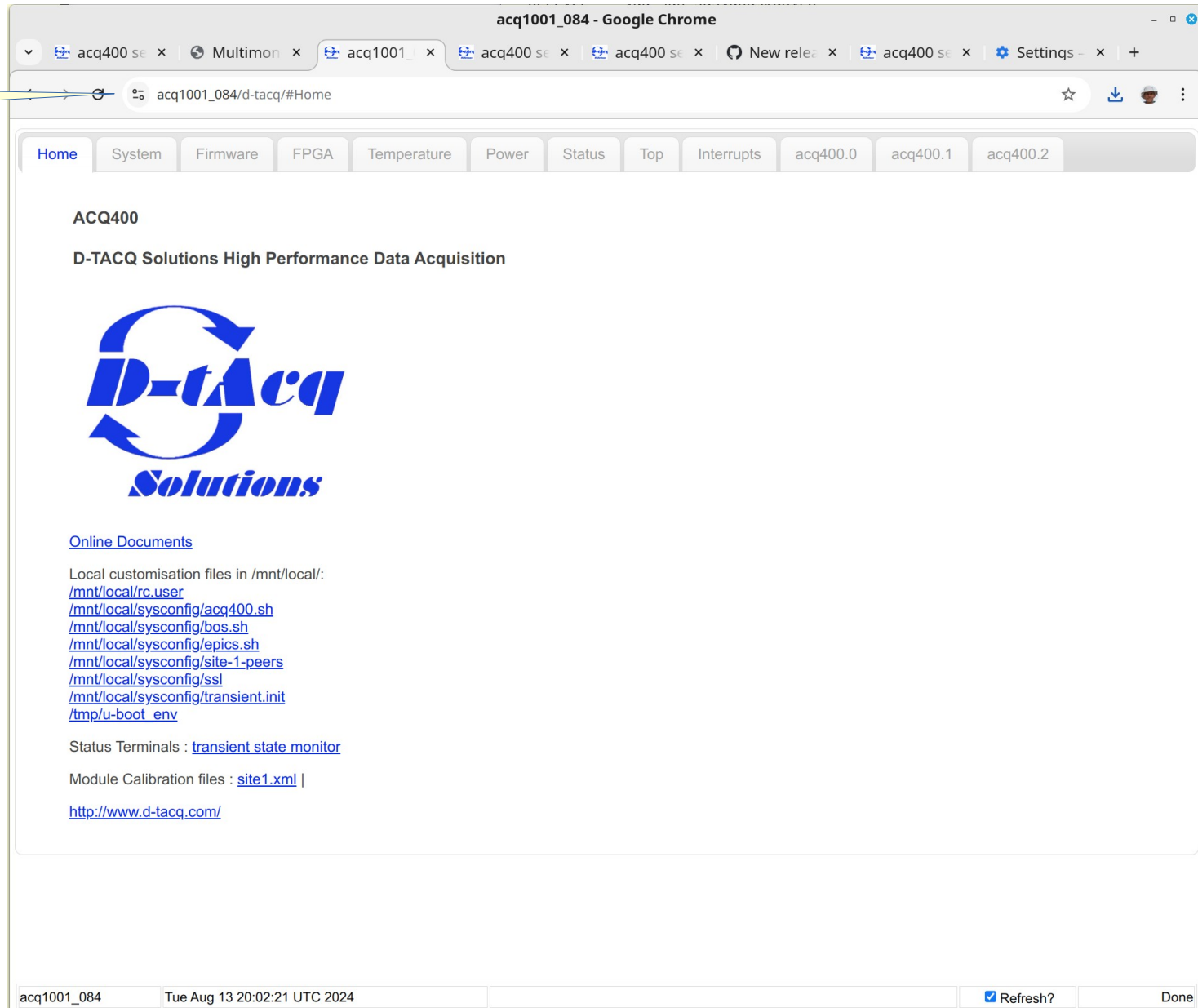
Select "Certificate",  
Follow the  
instructions on the  
D-TACQ web page  
to install the CA

Then click "https"

The screenshot shows a web browser window with two tabs. The left tab shows the ACQ400 website with a 'Not secure' warning in the address bar. The right tab shows the D-TACQ website with a 'Secure' status. A callout bubble points to the 'Not secure' warning. Another callout bubble points to the 'Secure' status. A third callout bubble points to the 'Certificate' link in the SSL notification. A blue arrow points from the 'Certificate' link to the 'https' link in the SSL notification. The SSL notification text reads: 'SSL is available. Install Certificate and go to https'. The D-TACQ website content includes the logo, navigation menu, and a section for 'acq400 series master CA' with instructions for Google Chrome and Firefox users.

# Secure browsing with CA installed

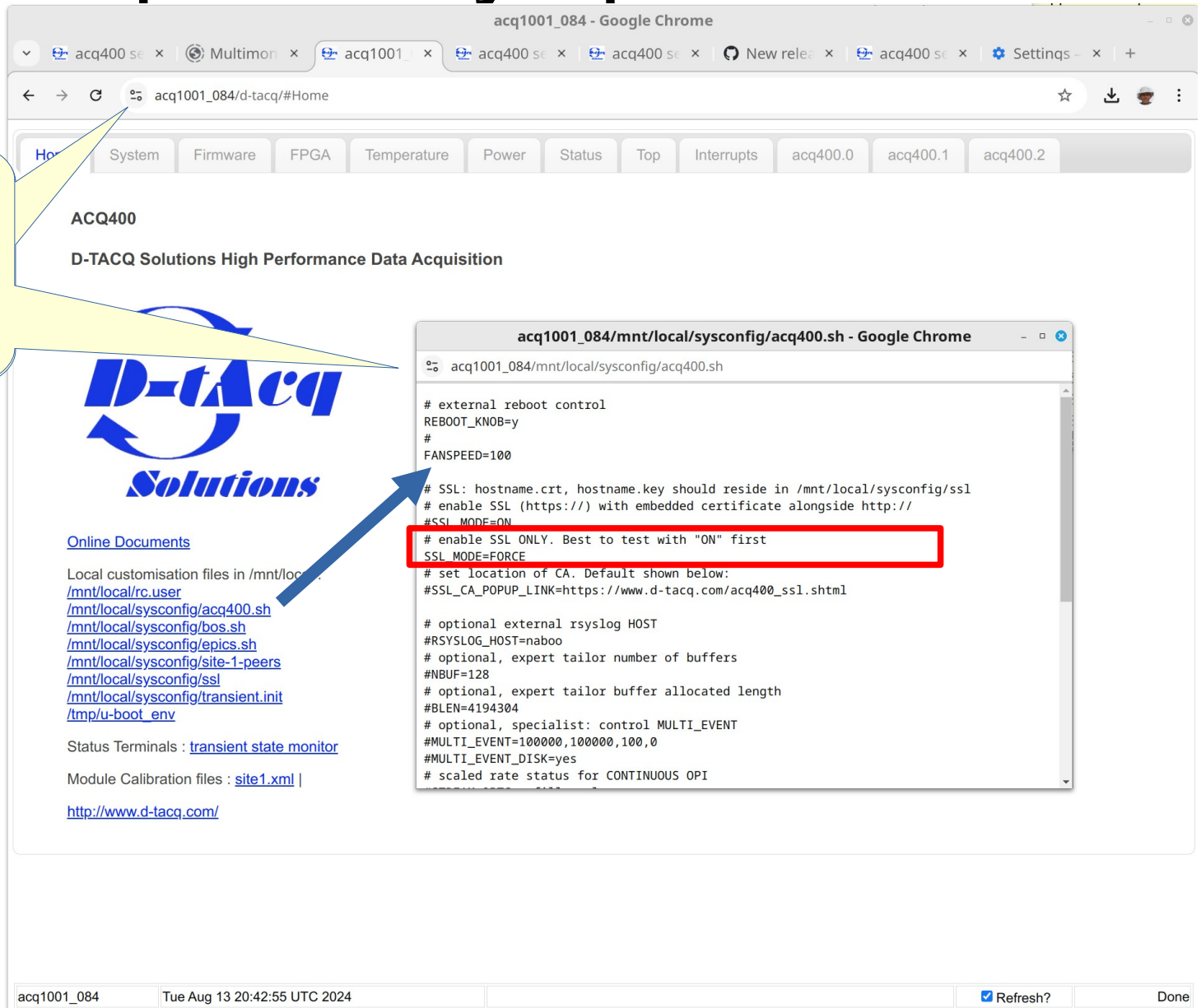
Secure



The screenshot shows a Google Chrome browser window with the address bar displaying a secure connection (https://) to the URL `acq1001_084/d-tacq/#Home`. The browser's address bar and tabs are visible at the top. The page content includes a navigation menu with items like Home, System, Firmware, FPGA, Temperature, Power, Status, Top, Interrupts, acq400.0, acq400.1, and acq400.2. Below the navigation menu, the page title is "ACQ400" and the subtitle is "D-TACQ Solutions High Performance Data Acquisition". The D-TACQ Solutions logo is prominently displayed in the center. Below the logo, there is a section titled "Online Documents" with a list of local customisation files in `/mnt/local/`, including `/mnt/local/rc.user`, `/mnt/local/sysconfig/acq400.sh`, `/mnt/local/sysconfig/bos.sh`, `/mnt/local/sysconfig/epics.sh`, `/mnt/local/sysconfig/site-1-peers`, `/mnt/local/sysconfig/ssl`, `/mnt/local/sysconfig/transient.init`, and `/tmp/u-boot_env`. There are also links for "Status Terminals : transient state monitor" and "Module Calibration files : site1.xml |". At the bottom of the page, there is a footer with the text `acq1001_084`, the date and time `Tue Aug 13 20:02:21 UTC 2024`, a "Refresh?" button, and the word "Done".

# https:// only option:

SSL\_MODE=FORCE  
Redirects http:// to  
https:// for complete  
Secure browsing.



The screenshot shows a web browser window with the URL `acq1001_084/d-tacq/#Home`. The page displays the D-TACQ Solutions logo and navigation tabs for System, Firmware, FPGA, Temperature, Power, Status, Top, Interrupts, acq400.0, acq400.1, and acq400.2. The main content area is titled "ACQ400" and "D-TACQ Solutions High Performance Data Acquisition". Below the logo, there are links for "Online Documents" and "Status Terminals".

A terminal window titled "acq1001\_084/mnt/local/sysconfig/acq400.sh - Google Chrome" is open, showing the contents of the `acq400.sh` script. The script includes various configuration options, and the line `SSL_MODE=FORCE` is highlighted with a red box. The terminal output is as follows:

```
acq1001_084/mnt/local/sysconfig/acq400.sh
# external reboot control
REBOOT_KNOB=y
#
FANSPEED=100
# SSL: hostname.crt, hostname.key should reside in /mnt/local/sysconfig/ssl
# enable SSL (https://) with embedded certificate alongside http://
#SSL_MODE=ON
# enable SSL ONLY. Best to test with "ON" first
SSL_MODE=FORCE
# set location of CA. Default shown below:
#SSL_CA_POPUP_LINK=https://www.d-tacq.com/acq400_ssl.shtml

# optional external rsyslog HOST
#RSYSLOG_HOST=naboo
# optional, expert tailor number of buffers
#NBUF=128
# optional, expert tailor buffer allocated length
#BLEN=4194304
# optional, specialist: control MULTI_EVENT
#MULTI_EVENT=100000,100000,100,0
#MULTI_EVENT_DISK=yes
# scaled rate status for CONTINUOUS OPI
```

# Options

- Feature is available for all systems from R709 on.
- New systems will ship with the necessary “sysconfig” enabling from September 2024
- Existing customers wanting to use the feature should ask D-TACQ for certificates for their units.
- Should the D-TACQ certificate distribution scheme not be appropriate for a site, it’s completely possible for the site to use the framework to adopt their own certificates.



# Appendix Setup Variable:

- Set in `/mnt/local/sysconfig/acq400.sh`
  - `SSL_MODE=OFF|ON|FORCE`
  - `SSL_CA_POPT=URL`
    - # possible site specific instruction page.
- What keys are held on the UUT:
  - Location: `/mnt/local/sysconfig/ssl/`
    - `HOSTNAME.crt`, `HOSTNAME.key`
  - The certificate supports the canonical hostnames `acq1001_123` AND `acq1001-123`
  - If using the “-” notation, rename the certificate to suit
  - The hostname needs to be a DNS name
    - (can be a local “file” dns eg “hosts file” in the client computer).
  - If using other hostnames, the site users will need to generate their own certificates, but the site can still make use of the same framework.