

To build the Turnkey project:

1. Select the **Project** drop-down menu and select **Make**, or use the F7 key as a shortcut to build the project.



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2. After a successful build, the bottom window should appear as shown below:



Figure 12-5: A successful build of Turnkey

Ensure that there are no errors and no warnings. To verify the files were built correctly, go to\Orbcomm_API_and_Files_1_3\APL_Orbcomm\Turnkey\Exe. There should be a TurnKey.out and a Q4Ka-xGT-x.x.x.-TurnKey.bin file with current timestamps, as shown below:

Ele Edit View Favorites Tools Help Sack Image: Sack in the sack in
Back
Address 🛅 C:\Source\Q4000_2.21_branch\applications\IAR\APL_Orbcomm\TurnKey\Exe
Name A Size Tupe Date Medified
Name – Size Type Date Modified
Q4Ka-HGT-2.21.1695.441-TurnKey.bin 39 KB BIN File 12/19/2011 9:31 AM
TurnKey.out 370 KB OUT File 12/19/2011 9:31 AM



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See Appendix E - Software file naming convention for the key to the file names.

The application's binary file is an independent executable. QUAKE'S foundation code does not have to be compiled and linked to the application file during the build process. Pointers allow the application to access required foundation functions and global variables. Changes to the application **do not** require the modem's foundation code to be downloaded again. Only the application binary file must be downloaded to the modem after being changed. This greatly reduces download times and simplifies the application build process.

12.2.2 Loading Turnkey with the QUAKE Configuration Tool (QCT)

Binary files are loaded into the modem using the QUAKE Configuration Tool (QCT). QCT is a utility with a Graphical User Interface (GUI) that allows custom application files to be downloaded into QUAKE modems. QCT can be downloaded from the Downloads page of the QUAKE website, or obtained by contacting QUAKE customer support. See <u>Section 2.4.1</u> for more information on QCT.

For debugging QUAKE modem applications, a host computer with two serial ports should be used. One port is connected to the modem's Logger serial port, and the other to the modem's Main Transport Socket (MTS) serial port. A single computer should be used for both development and loading files to speed development time. Two serial cables are required.

1. To access the output data on the Logger port, open a terminal emulation program (such as HyperTerminal) on the host computer and configure the COM port to the following settings:

Baud rate:	115200 bps
Data bits:	8 .
Parity:	None
Stop bits:	1
Flow control:	None 🦰 🍆

The Logger port displays output from the modem's foundation code. It can also display printf statements from your custom code.

2. Connect a serial cable from a COM port of the host computer to the MTS port of the QUAKE modem. Start QCT.

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3. Select the correct COM port, with Baud Rate of 4800, and then click Connect

Communication Port Settings
Please select a communication port:
○ СОМ1 ○ СОМ3 ○ СОМ4
Data Rate 4800 💌
<u>Connect</u> Ca <u>n</u> cel

Figure 12-7: QCT - Communication port settings

4. QCT will then display your connection status:

Quake	e Configuration	n Tool v. 1	.0 Release - [Pr	oject: N	one]		
oject	<u>S</u> erial Ports	<u>T</u> ables	Configuration	<u>F</u> lash	Development	<u>W</u> indow	
Inforn	nation Window	,					
Conne	ected to com p	ort COM1	@ 4800 baud ra	ite			
I							
	12.8. ОСТ	Conr	option statu		`		

5. Select Elash , then Load Application A

<u> 4</u> Quake Configuration Tool 1.2	TO MIN IL T ANNO 1
File <u>Serial Port</u> <u>Configure</u>	Elash Program
Connected to serial port (Delete File D
connected to senar port v	Load File L
	Load Application A
	Load Firmware F

Figure 12-9: QCT - Flash menu

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6. A dialog box appears, allowing you to browse to TurnKey.bin. Browse to the directory containing the xxx-TurnKey.bin and double-click to select it.

🕌 Quake Configuratio	n Tool 1.2
File Serial Port Co	onfigure <u>F</u> lash Program
Connected to seri	ial port COM3 (4800 bps)
Application Load	×
Local File	Browse
Remote File	APL/CUST_APL.BIN
	Load Close
,	
Figure 12-10: QCT	- Application Load (browse)
Figure 12-10: QCT 7. Click Load t	- Application Load (browse) o begin the download process:
Figure 12-10: QCT 7. Click Load t Application Load	Application Load (browse) o begin the download process:
Figure 12-10: QCT 7. Click Load t Application Load Local File	- Application Load (browse) o begin the download process: MKey/Exe\Q4Ka-HGT-2.11.4696.10334-TurnKey.bin Browse
Figure 12-10: QCT 7. Click Load t Application Load Local File Remote File	- Application Load (browse) o begin the download process: MKey/Exe\Q4Ka-HGT-2.11.4696.10334-TurnKey.bin Browse APL/CUST_APL.BIN
Figure 12-10: QCT 7. Click Load t Application Load Local File Remote File	- Application Load (browse) o begin the download process: MKey/Exe\Q4Ka-HGT-2.11.4696.10334-TurnKey.bin Browse APL/CUST_APL.BIN Load Close

Figure 12-11: QCT - Application Load (load)



8. The download information is displayed in QCT's information window. When the download is complete, QCT reports that the "File update was successful".

🐇 Ç	uake Configur	ration Tool 1.2	2				\mathbf{i}
File	Serial Port	<u>C</u> onfigure	<u>F</u> lash	Program			
Ret Steese See See See See See See See See See	ading file: (art transmis sponse has arting data at 1024/26 nt 2048/26 nt 2048/26 nt 3072/26 nt 3072/26 nt 4096/26 nt 5120/26 nt 6144/26 nt 7168/26 nt 9216/26 nt 9216/26 nt 9216/26 nt 10240/2 nt 10240/2 nt 12288/2 at 13312/2 nt 13312/2 nt 13360/2 nt 16384/2 nt 16384/2 nt 16384/2 nt 17408/2 nt 18432/2 nt 19456/2 nt 20480/2 nt 2552/2 nt 2552/2 nt 25500/2 nt 26092/2 atting for mo	26092 bytes sion of prin been receiv transfer. 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 092 bytes, 6092 bytes 6092 bytes	21031 ary ima ed from 3% 7% 11% 15% 19% 23% 27% 31% 35% , 39% , 43% , 51% , 54% , 54% , 54% , 54% , 66% , 74% , 74% , 78% , 82% , 86% , 90% , 94% , 98% , 100% ogram f	age to the mo n the target.	dem		
File	e update wa	s successfu					
			_				

Figure 12-12: QCT - Successful file download

SNote:

The application is always stored in the modem's non-volatile memory (NVM) in **APL/CUST_APL.BIN**. If you have problems with the download, please consult the QCT Manual.

12.2.3 Running Turnkey

If the requirements of your application are similar to Turnkey or one of the DemoApps, make a copy of the application and use it as a starting point for your application. If none of the examples are sufficient, use the empty event-driven template of QuickStart as a basis for your application, adding functionality through your custom 'C' code and through calls to the QUAKE APIs.

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Once you have the Logger port connected and configured, and the Turnkey binary file has been downloaded, cycle power on the modem. You should see the following output on the Logger port:

继LOGGER - HynerTerminal	_ 10
File Edit View Call Transfer Help	
Copyright (C) 2010 Quake Global Inc. All rights reserved. This work is the copyrighted intellectual property of Quake Global Incorporated, and may not be copied, decompiled, modified, or distributed, in whole or in part, without the express written permission of the copyright holder. The copyright notice above does not evidence any actual or intended publication of such source code.	
Boot Loader Version 2.1 Built at 15:01:55 on Jun 9 2010 Verifying the image Loading Version 1.2 of the Quake Foundation Noted: 2198.569 Product: 1, Feature: a Starting the image	
CP Code version Dec 1 2010 09:36:25 Configuring RTC SYS_setTime: Updated system time status (Src RTC Sync 0) Current Time:	
This unpublished source file is the copyrighted intellectual property of Quake Global Incorporated, and may not be copied, decompiled, modified, or distributed, in whole or in part, without the express written permission of the copyright holder. The copyright notice above does not evidence any actual or intended publication of such source code.	
THIS PRODUCT IS COVERED BY THE FOLLOWING US PATENTS: 7,289,533. OTHER PATENTS PENDING.	
desired_gwy_id: 1 Quake GTobaT SC #QWAKETEST027 TL Code version 1.12.1 No ETS_CHANNEL_MODES; default to elapsed times inactive. No SMH_WRITE_INTERVAL; default to 720 seconds.	
Starting customer application Quake Turnkey APL Version Nov 30 2010, 09:54:30	
accessPointName = ORBCOMM.T-MOBILE.COM serverName = mail.gmx.com	
serverPort = 25 smtpUser = quaketest11@gmx.com smtpPass = Quaketest11 smtpToAddress = jlitvak@quakeglobal.com smtpDefaultSubject = Testing	
Parameters may be set using the CtgMgr Utils (type U C M to access) Parameter names and current settings are: TK_POWER DOWN_AFTER_MSG 0 TK_XMIT_INTERVAL 600 TK_RX_INTERVAL 120	
IK_PAKAN_NASK 0xttttttt TK_POWER_DOWN_GSM_AFTER_MSG 0 TK_ENABLE 1 TK_PGNO_NUMBER 65263 Beading 1 MSN LL elements from NVM	
MSN LL[0] Gwy 1 SCT: Msg 0 967554511 Gg 0 971471311 SCO: Msg 1 Gg 1 Rpt 2 Turning on TERR modem Sent GPS stop cmd GPS: Power off	
Connected 0:25:51 VT100 115200 8-N-1 SCROLL CAPS NUM Capture Print echo	

Figure 12-13: Logger output of Turnkey application startup

The information above is generated by the modem foundation code and provides information on code versions, various low-level processes and initialization routines. The information related to the downloaded application follows immediately after the statement: **Starting customer application**.

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APL_init(void) is the first application function called by the QUAKE firmware, and is the starting point for custom code development. The statement: Quake Turnkey APL Version Nov 30 2010, 09:54:30 indicates that the application is running properly and your development environment is ready to begin developing custom applications.

12.2.4 Stopping and removing Turnkey from the modem

If an incorrect version of the application is downloaded and causes the modem to crash or reboot, there is a command sequence to allow you to stop the modem and remove the application.

To stop the application:

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- 1. Type 'd' 'R' on the Logger port to initiate a reboot.
- Immediately press the 'x' key on the Logger Port <u>during boot up</u> until you get a prompt
 asking: *CANCEL LOAD OF CUSTOMER APPLICATION?*. It may be necessary to press the
 'x' key numerous times until you receive the prompt.
- After the prompt, type 'Yes' (it is case-sensitive).

After that, the application is halted so that the file may be removed and a new application can be downloaded into the modem



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4. To remove the binary application file from NVM, type 'd' `f' on the Logger port. You should see the following debug menu screen.

I Logger - HyperTerminal	_ 0	×
File Edit View Call Transfer Help		
QSM_registerRxUser: QDM registered port 1 prio 110 id 0 QSM_registerRxUser: SPV registered port 2 prio -90 id 2 Configuring for NTS Setting MTS Port baud rate to 4800 NTS TD SET 1 LOADED		*
QSM_registerRxUser: SPV registered port 2 prio 100 id 0		
QSM_registerRxUser: SPV registered port 1 prio 100 id 2 Quake Global SC #INTS TEST IDs] TL Code version 1.12.1 No ETS_CHANNEL_MODES; default to elapsed times inactive. No SMH_WRITE_INTERVAL; default to 720 seconds. QSM_registerRxUser: SPV registered port 2 prio 85 id 3 QSM_registerRxUser: SPV registered port 1 prio 85 id 3 'x' RECEIVED. CANCEL LOAD OF CUSTOMER APPLICATION? TYPE "Yes" TO CONFIRM> Yes ****APPLICATION LOAD CANCELLED GPS: Power off Input voltage 12.1 Volts Input voltage 12.0 Volts		
<pre>***Debug Mode enabled*** (will expire in 20 Secs) f CHOOSE FROM THE FOLLOWING: 'd' List directory 'v' View file (ASCII) 'V' View file (Hex) 'r' Remove file 'm' Rename file 'c' Create dir 'C' Clear dir 'R' Remove dir 'f' Format FFS 'n' Number of FFS writes 'u' Unprotect IFlash 'p' Protect IFlash 'b' Change boot image 'q' Quit</pre>		
		E
		-
Connected 0:46:30 Auto detect 115200 8-N-1 SCKULL CAPS NUM Capture Print echo		

Figure 12-14: Entering the Debug Flash menu

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5. To remove the bad application file completely, type: 'r', and then 'APL/CUST_APL.BIN' when prompted for the file name.



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The application is always stored in this directory under this name. This removes the file from NVM.

File Edit View Call Transfer Help	
No SMH_WRITE_INTERVAL; default to 720 seconds. OSM_registerRxUser: SPV registered port 2 prio 85 id 3 OSM_registerRxUser: SPV registered port 1 prio 85 id 3 'x' RECEIVED. CANCEL LOAD OF CUSTOMER APPLICATION? TYPE "Yes" TO CONFIRM> Yes ***APPLICATION LOAD CANCELLED	
GPS: Power off Input voltage 12.1 Volts Input voltage 12.0 Volts ***Debug Mode enabled*** (will expire in 20 Secs) f CHOOSE FROM THE FOLLOWING: 'd' List directory 'v' View file (ASCII) 'V' View file (Hex) 'r' Remove file 'm' Rename file 'c' Create dir 'C' Clear dir 'R' Remove dir 'f' Format FFS 'n' Number of FFS writes 'u' Unprotect IFlash 'p' Protect IFlash 'b' Change boot image 'g' Ouit	
> r Enter file name> APL/CUST_APL.BIN	
'd' List directory 'v' View file (ASCII) 'V' View file (Hex) 'r' Remove file 'm' Rename file 'c' Create dir 'C' Clear dir 'R' Remove dir 'f' Format FFS 'n' Number of FFS writes 'u' Unprotect IFlash 'p' Protect IFlash 'b' Change boot image 'q' Quit	
onnected 0:50:56 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo	

Figure 12-15: Stopping and removing the application

6. Type 'q' to quit the debug mode.

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7. After rebooting the modem, you will see the statement: 'No Application found ' if the application has been deleted correctly.

Logger - HyperTerminal	
File Edit View Call Transfer Help	
) 🖆 📾 🍒 🗈 🎦 😭	
publication of such source code.	
THIS PRODUCT IS COVERED BY THE FOLLOWING US PATENTS: 7,289,533. OTHER PATENTS PENDING.	
Input voltage 12.0 Volts	
QSM_registerRxUser: SPV registered port 2 prio -100 id 1 QSM_registerRxUser: SPV registered port 1 prio -100 id 1 QSM_registerRxUser: SPV registered port 0 prio 0 id 1 QSM_registerRxUser: SPV registered port 0 prio -100 id 2 GPS task started	
QSM_registerRxUser: QDM registered port 1 prio 110 id 0 QSM_registerRxUser: SPV registered port 2 prio -90 id 2 Configuring for NTS Setting MTS Port baud rate to 4800 NTS TD SET 1 LOADED	
QSM_registerRxUser: SPV registered port 2 prio 100 id 0 QSM_registerRxUser: SPV registered port 1 prio 100 id 2 Quake Global SC #[NTS TEST IDs] TL Code version 1.12.1	
No ETS_CHANNEL_MODES; default to elapsed times inactive. No SMH_WRITE_INTERVAL; default to 720 seconds. QSM_registerRxUser: SPV registered port 2 prio 85 id 3 QSM_registerRxUser: SPV registered port 1 prio 85 id 3	
No Application found NVM_vdKestoreMsnFromNVM: LL empty Sent GPS stop cmd GPS: Power off -	

Figure 12-16: The application was successfully removed



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In most cases it is not necessary to remove an application from the modem if you simply want to replace it with a new application. When you load the new application with QCT, it will over-write the existing application file.

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