Source		🜌 AMIQ Remote Control		×
- Select Source File(s)		Info Rohde&Schwarz, AMIQ,	848541/014, V 1.100617á (J	un
		Loading waveform file into RAM	1	_
		Load HD File	Load Floppy File	11
Source File		Currently		-
No of Samples	0 Transmit	loaded none		
Source File Q		Event Control	1.1	1
No of Complex	Transmission	Stop	Execute Batch	
	User File Info			
🔷 Add <u>G</u> uard Samples 🛛 ಿ 🛈	<u> </u>	tate Shi	ft in Samples	
	Source			
Clock	C WV formatted File			
Presetting 25000.000				
Colort Destination File(s)	Destination	T ON		
- Select Destination File(s)	G AMIQ HAM			_
Lestinator File	C AMIQ RD	Re	call Delete	
Du Services Edu .	C WV formatted File			
		etting	File Management	1
Sage Appond	<u>K</u> a	ncel Test and A	Adjustment	
		Clos		

Products: AMIQ, SMIQ

AMIQ-K2 Program for Transferring Various-Format I/Q Data to AMIQ

The software AMIQ-K2 enables you to read, convert, and transfer various-format I/Q data files to AMIQ format.

AMIQ-K2 also provides you with remote control for AMIQ.



Subject to change - Detlev Liebl.10.99 - Application Note 1MA10_03

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1 Overview

The I/Q-Modulation Generator AMIQ provides high precision I/Q analog output for data calculated by the software WinIQSIM.

Additionally, the software AMIQ-K2 enables you to read, convert, and transfer existing data files from various other programs to AMIQ format.

Input formats supported by AMIQ-K2 are:

- The propriety R&S programs IQSIM and DAB-K1.
- Mathematic calculation programs like Matlab and Mathcad.
- AWG202, COSSAP and ADS data files.

AMIQ-K2 also provides you with remote control for AMIQ.

For hardware and software requirements see section 2.

AMIQ-K2 transfers data to AMIQ using either

- GPIB
- RS232.

An extensive manual is supplied to help you use AMIQ-K2.

2 Hardware and Software Requirements

Hardware Requirements

he program will run on any IBM AT compatible computer with

- CPU: 486, Pentium or better; clock rate >100 MHz
- RAM: > 32 MByte (for Windows NT > 48 MByte)
- Monitor: VGA color monitor minimum 800x600
 recommended 1024x768
- GPIB: GPIB (IEEE) -bus card Rohde & Schwarz: IEEE 488.2 Bus Interface PS-B4, 1006.6207.04 or National Instruments AT-GPIB / TNT

Software Requirements

- Windows 95 or Windows NT (version 4.0 or later)
- GPIB (IEC) bus driver (as appropriate to the operating system)

3 Installation and Setup

Downloading and Installing the Software

AMIQ-K2 is supplied as a packed file. In an empty directory of your choice:

- 1. Download 32amiqk2.exe
- 2. Run the downloaded exe-file.

The following files are created in the chosen directory:

setup.exe	(installation program)
AMIQ1MAA.001	(compressed program)
AMIQ1MAA.002	(compressed program)
circle.i	(example file)
circle.q	(example file)
dab_m3.sym	(example file)
To install AMIQ-K2:	run setup.exe

Creating Installation Disks

You will need two disks:

- 1. Copy setup.exe and AMIQ1MAA.001 to disk 1.
- 2. Copy AMIQ1MAA.002 to disk 2.

To install AMIQ-K2 from the disks:

- 1. Insert disk 1 in the disk drive.
- 2. Run setup.exe.
- 3. Insert disk 2 in the disk drive when requested by the setup program.

Connecting the Computer and AMIQ

For the RS-232 interface connect the devices using a null modem cable (see AMIQ manual section 5).

For GPIB control connect the devices using a GPIB standard cable.

Configuration

The default setting for AMIQ-K2 software are:

- Connected using GPIB.
- AMIQ-GPIB-Address = 6.
- Automatically retry previous interface.
- Automatically load and start waveform after transmission.

Modify these interface and transmission parameters - if necessary - as described in section 3.2 of the AMIQ-K2 manual when you first operate the program.

4 Principles of Operation

The user interface uses a Windows-like design with buttons and fields. Navigate round the interface using the mouse, or with the tab and hot keys.

To run, double click on the AMIQ-K2 icon. The program displays the **Source Panel**:

Source	
Select Source File(s)	
Type IQSIM (ASCII)	Signal & <u>T</u> ransmit
Source File	
No of Samples 0	
Source File Q	
No of Samples 0	
🔶 Add Quard Sumplex 🍨 👔	
Clock	
Presetting 25000.000 Hz	<u>R</u> em. Control
Select Destination File(s)	
Lestination File	
Devenution File	
Saye Apparal	Egit

Fig. 1: Source Panel

- 1. Use the **Type** field to select the source format type.
- 2. Use the Source File buttons to select the source data files.
- 3. Use the **Signal &Transmit** button to adjust the input values of the dynamic range and to start transferring the source data to the AMIQ.
- 4. Use the Clock Presetting field to enter the clock presetting.
- 5. Use the Rem. Control button to open the AMIQ Remote Control panel.
- 6. Use the **Exit** button to leave the program.

5 Selecting the Source FormatType

Open the format type list by clicking the down arrow in the **Select Source File** field.

The following source data formats are supported:

Type	IQSIM (ASCII) 📃 🔻	
Source File	✓ IQSIM (ASCII)	
No of Samples	Matlab	
Source File Q	Mathcad (single)	
No of Samples	Mathcad (mixed)	
C Add Guard Sample	DaDisp (single) DaDisp (mixed)	
	COSSAP (single)	
Clock	COSSAP (mixed)	
▲	AWG2021	
Presetti <u>ng</u> 👳	ADS (ASCSIG)	B

Fig. 2: Format Types

IQSIM and DAB-K1:

output from the corresponding R&S software packages.

<u>Matlab, Mathcad and Dadisp:</u> output from the corresponding mathematic calculation programs. <u>COSSAP,AWG2021, ADS:</u> output in the correspondingmanufacturers'

For some of these formats, the I and Q data are mixed in one file, for others they are separated into two files. For Mathcad, DaDisp and COSSAP both one and two file formats are provided.

format.

6 Selecting the Source Data Files

- 1. Click the first (upper) **Source File** button in the source panel.
- 2. Select one source file in the Open File Menu.

Open I File Menu ?					? ×
Directory History: Suchen in: Ascii.i delii Dix1.i Wi_test.i Zzz.i	C:\Programme\LabWind	ows\amiq-k32\inpf	les		
 Datei <u>n</u> ame: Datei <u>t</u> yp:	×.i ×.i		•	<u>S</u> elect Abbreche	n

Fig. 3: Open File Menu

For I/Q data in separate files:

- 1. Activate the second Source File button.
- 2. Select the second source file.

The source files are analysed by the software, and the number of samples is calculated and displayed at the source panel.

If you specify only the I or the Q data file (if I and Q are separated) the software automatically sets the unknown values to zero during transmission.

7 Adjusting the Dynamic Range

Click the Signal &Transmit button in the source panel.

The **Signal** Panel opens:

1	Signal	×				
	Effective Use of Internal Word Width					
	Æuto (Expands Input Values to F)	6 Automatically)				
	○ Off (Apply Input Values -8000	+8000 for FS)				
	C Manual Adjust	78 👀 🚓				
	— Output Signal Display					
	Peak (PEP Offset)	0.00 dB				
	-60 -40 -20	Ó dB				
	AMIQ Samples Clipping					
	Bofrech RMS	-3.01 dB				
	Duplay Crest	3.01 dB				
	Clipped Samples	0.00 %				
	Clipped Power	0.00 %				
		ansmit				

Fig. 4: Signal Panel

- 1. Click **Auto**, if the input data shall be normalised to use the maximum dynamic range of the AMIQ (the default)
- 2. Click **Off**, if the input data shall be used as AMIQ data words without any normalising (full scale is obtained at input values of -8000 and 8000)
- 3. Click Manual Adjust, if you want to adjust manually.

The peak vector length will be shown as a value and a blue bar. 0 dB corresponds to the unit circle.

Clipping will be shown by a red indicator. The display values are shaded then and remain unchanged.

Click **Refresh Display** to update the display values.

8 Transferring Data to AMIQ

1. Click the **Transmit** button in the signal panel.

The source data is read in, converted and stored in an internal buffer. A progress bar lets you monitor the conversion. Once the conversion is complete, the **Store Converted Data** panel opens:

🔁 Store Converted Data 🛛 🛛 🗙
User File Info
Source
Converted Source File(s)
O WinIQSIM *.wv File
Destination
C AMIQ HD
C AMIQ Batch Floppy
WinIQSIM *.wv File
O WinIQSIM *.ibn File
<u>O</u> K <u>Cancel</u>

Fig. 5: Store Converted Data Panel

- 2. Check and modify if necessary the switches for source or destination.
- 3. Click OK.

The data is transferred from the internal buffer to AMIQ. A progress bar lets you monitor the transfer.

AMIQ-K2 also supports precompiled **WV formatted** files (from WinIQSIM software) and can store source data as WV formatted files on the host or (from revison 1.4) as ibn-files for adding signals to WinIQSIM.

For creating an **AMIQ Batch Floppy** see section 5.27 in the WinIQSIM manual.

If AMIQ is configured to Automatically load and start waveform after transmission (see section 2.3) it immediately starts outputting I and Q signals.

You can start and stop the output manually in the **Remote Control Panel** (see section 9).

9 Additional Features of the Source Panel

AMIQ Clock Presetting

Presetting	25000.000	Hz	<u>R</u> em. Contro

Fig. 6: Clock Presetting

Note: Enter a value between 100 Hz and 1000 MHz This will first change the AMIQ clock <u>after</u> the next transmission.

Adding a Guard Period for the DAB-K1 Format

The Guard Samples are only enabled if the DAB-K1 format is selected.



Fig. 7: Adding Guard Samples

- 1. Enter the number of samples you want to add.
- 2. Activate the Add Guard Samples switch.

The Guard samples are added during transmission.

Saving and Appending Source Files

IQSIM and DAB-K1 source files can be copied and appended to other files.

- 1. Select at least one **Source File** as described in section 5.
- 2. Use the **Destination** buttons to specify the target (the Open File Menu appears)
- 3. Click either the Save or the Append button

Select Destination File(s)	1
Destination File	
Destination File Q	
Sa <u>v</u> e Append	E <u>x</u> it

Fig. 8: Saving and appending source files

If the **Add Guard Samples** switch is activated and a number is entered, the destination file will be enlarged by these samples.

10 Marker Setting

The AMIQ supports up to 4 independent markers to provide trigger and control signals during a running output sequence.

Open the Marker Setting panel using the menu bar (AMIQ:Marker Settings...)

Marker Setting				
Current Marker Marker 1				
	Name M	1		
Define M	arker Point			
Sam	ple Index 🏮 0	Add Marker		
	State 1	Boint		
Marker L	ist			
	Sample Index	Marker State		
🚔	0	1		
	100	0		
	0	0		
	Û	Û		
-	0	0		
Delete Marker Point Reset List				
	Show Marker Graph			
	<u>0</u> K	Cancel		

Fig. 9: Marker Settings

- 1. Select the Current Marker.
- 2. Modify the Name of your marker if needed.
- 3. Enter the **Sample Index** beginning from which the marker state should change.
- 4. Enter the new Marker State.
- 5. Copy the complete setting the **Add Marker Point** button to the **Marker** List.

You can:

- Delete single entries with Delete Marker List.
- Delete all entries with Reset List.
- Check the marker timing with Show Marker Graph.

Note: The markers appear <u>after</u> the next transmission.

11 AMIQ Remote Controlling

Open the Remote Control panel by clicking the **Rem. Control** button in the Source panel.

🚰 AMIQ Remote Control 🛛 🛛 🔀					
Info Rohde&Schwarz, AMIQ, 848541/014, V 1.100617á (Jun					
_Loading wave	eform file into RAM				
Load	HD File	Load Floppy File			
Currently loaded	none				
Event Control					
Sta <u>r</u> t	Stop	Execute Batch			
Marker	State Shift in Sa	mples			
Ch. 1	🔽 ON 🏮 O				
Ch. 2	🗖 ON 🌲 🖯				
Ch. 3	🗖 ON 🌲 🖯				
Ch. 4	□ ON 🗘 0				
Save/Recall					
Save	Recall	Delete			
More					
Hardwa	are Setting	File Management			
	Test and Adjustm	ent			
1	Close				

Fig. 10: Remote Control panel

- 1. Load data stored on the AMIQ hard- or floppy- disk to the AMIQ RAM.
- 2. Start or Stop the signal output.
- 3. Execute a **Batch** job (created by WinIQSIM software).
- 4. Enable Markers and shift them if necessary.
- 5. Save or Recall or Delete AMIQ setup.
- 6. Use the **File Management** button to copy or delete files or directories at the AMIQ harddisk.

The **Hardware Settings** and **Test and Adjustment** buttons open subpanels described in the next two sections.

12 AMIQ Hardware Setting

Open the Hardware Settings panel by clicking the **Hardware Settings** button in the Remote Control panel.

🔁 AMIQ	Rem. Ctrl.: Hardware Settings	х		
COutput-		_		
Level	Channel I: C Off G Fix C Var			
	Lovel 🗘 0 50			
	Channel Q: 🔿 Off 🙃 Fix 🤿 Var			
	Level 0 🌻 0.50			
Filter	● Off ● 2.5 MHz ● 25 MHz ● EXT			
Source				
	Clock 🚔 10000000.000 Hz			
Reference Oscillator				
	🙃 internal 🦳 external			
_Trigger-	r	=		
Mode	C Off C auto C single			
	C gated C ext-auto C ext-single	Ш		
Slope	high/rising	Ī		
1				

Fig. 11: Hardware Settings panel

The values shown in this panel are read from the AMIQ when the panel is opened. $% \left({{\left[{{{\rm{AMIQ}}} \right]} \right]_{\rm{AMIQ}}} \right)$

• Enter your own settings.

Changes are carried out immediately.

13 AMIQ Test and Adjustment

Open the Test and Adjustment panel by clicking the **Test and Adjustment** button in the Remote Control panel.

💋 AMIQ Rem. C	.: Test and Adjustment	×		
Test Self <u>T</u> est				
Adjustment				
Internal Adjustment				
User Correction				
	S <u>e</u> t to Default			
Gain:	I ≜ 0.000 Q ≜ 0.000			
Offset: FIX	I \$0.000 Q \$0.000			
VAR	I \$0.000 Q \$0.000			
Skew:	0.000			

Fig. 12: Test and Adjustment panel

- 1. Use the Self Test button to run the AMIQ self test.
- 2. Use the **Internal Adjustment** button to start the automatic self adjustment procedure.
- 3. Use the **User Correction field** to enter compensation values for user level and delay mismatch.

14 Ordering information

Type of instrument AMIQ SMIQ03

1110.2003.03 1125.5555.03



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