SONIFEX

DHY-04, DHY-04G & DHY-04HD

Single Auto Digital TBU, AES/EBU & Analogue I/O With Ethernet.
Single Auto GSM Hybrid, AES/EBU & Analogue I/O With Ethernet.
Automatic HD Voice & GSM Hybrid, AES/EBU & Analogue I/O With Ethernet.

2016

Catalogue

What Is A Telephone Hybrid?

Telephone hybrids, or telephone balance units (TBUs) provide the interface between professional audio equipment and the public telephone network. They provide protection for your equipment and the public telephone lines, allowing for varying line signals and line conditions. Automatically cancelling out the unwanted signal they also facilitate two-way communication down a single telephone line.

Each telephone hybrid has a telephone line connection, a handset connection and separate terminals for audio input and output from a broadcast mixer, or other professional audio source.

A large proportion of Sonifex hybrids are used in radio and television broadcasting applications for allowing external callers to be connected to the studio mixing console. Most of the other units are supplied to communication operations for allowing extremely effective conversion between 4-wire audio circuits and standard telephone lines.

A ringing detector can be used when you need to answer a call automatically, for instance, if a journalist files a report to a PC recorder over a telephone line, the call can be picked up after a set number of rings by the ringing detector. Both the HY-03 & DHY-03 have a built in ringing detector that is enabled by one of the configuration settings switches on the rear panel.

Line Powered, Analogue, Digital or GSM or HD Voice?

Sonifex offer a few different hybrid units:

- The CM-TBU & CM-TLL line powered hybrids.
- The HY-03 analogue telephone hybrid.
- The DHY-03 DSP based telephone hybrid.
- The DHY-04 DSP based telephone hybrid.
- The DHY-04G DSP based GSM hybrid.
- The DHY-04HD DSP based HD Voice & GSM hybrid.

The extremely compact **CM-TBU** and **CM-TLL** units are portable and powered from the telephone line, providing a basic voice interface to a 4-wire circuit with separate level control of send and receive signals, useful for talkback applications.

The analogue **HY-03** hybrid is suitable for most general telephony applications and is often used in radio and TV stations, trading floors and conferencing centres. The HY-03 can be used for any application where a clean telephone signal is required and the line is not subject to signal delay.

The **DHY-03** offers near perfect performance, using DSP power to dramatically improve the unit's operation. The DHY-03 offers the features of the HY-03, but has some other benefits:

- Echo cancellation is possible and distortion of other mixed signals is greatly improved.
- Digital hybrids are more tolerant to fluctuating line conditions and are especially suitable for dealing with calls that have a slight signal delay, for example, satellite and conference calls.

The
DHY-03 can recall signals from its memory buffer and allow for these delays without impairing performance.

The **DHY-04** is a redesign of the DHY-03 hybrid and adds Ethernet connectivity with a built-in web browser for configuration, control and dialling, combined AES/EBU digital and analogue audio inputs and front panel speed-dial buttons.

The **DHY-04G** uses a GSM SIM card to connect callers on the 2G/GSM cellular network to a radio/TV mixing console connected to the DHY-04G 4 wire input and output.

The **DHY-04HD** uses a 3G SIM card to connect callers on the 3G cellular networks using HD Voice wideband audio to provide a high quality audio call. This is ideal for broadcasters and journalists providing a frequency response up to 7kHz (twice that of a normal GSM or POTS connection). It converts 3G or GSM calls to the 4 wire audio signal to and from a connected mixing console.

Note: The CM-TBU, CM-TLL, HY-03 , DHY-03 and DHY-04 products are operating on analogue telephone lines, not ISDN or IP digital lines. The "analogue" and "digital" refer to the processing used in the units.

DHY-04
Telephone Hybrid

DHY-04 Single Automatic Digital TBU, AES/EBU & Analogue I/O With Ethernet

Category: Digital Telephone Hybrids.
Product Function: Provides separation between send and receive signals on an analogue telephone network, provides professional level balanced input & output signals and has echo cancellation.
Typical Applications: Radio & TV station talk shows, telephony interface to the mixer.
Features:

- Fully automatic - adapts to varying line conditions and has automatic signal limiting.
- Fully adaptive echo cancellation to 127msec - default is 24msec.
- 70dB typical line balance rejection offering superb performance and crystal clear audio.
- Front panel input and output gain controls.
- Front panel LED metering of receive and send signals.
- Built-in conferencing for 2 hybrids, so that a single telco channel on a mixing desk can receive 2 calls.
- Integrated ring detector - automatic call answering after a pre-determined number of rings.
- Automatic call disconnection. Fitted with K-break, line polarity reversal and dial tone disconnect detection, defined by the country selection.
- Automatic ducking facility allows the talent to 'shout-down', or talk over, a caller by reducing the gain of the caller's signal if it goes above a certain level.
- Local and remote line hold switching - calls can be remotely switched through a mixing console.
- Line hold/release button to control line hold circuit, illuminates to indicate the status of the line and flashes to show ring status.
- DTMF tone recognition allowing a opto-isolated GPI output to be made on receipt of selected DTMF tones, e.g. for starting a studio automation recorder automatically to record a remote telephone interview.
- International operation with built-in configurable settings for each country.
- Country selection allows the unit to provide line impedance and a simulation circuit to match the country.
- RS232 serial port for remote control of the TBU & DTMF tone dialling.
- Remote port distributes the remote line connect switch and tally output, a momentary/latch selector and the DTMF detect output.
- The remote line connect switch can be either momentary or latching in its action.
- Balanced mic/line input - 10k balanced input selectable for 0dBu clean feed line, or microphone level with adjustable gain.
- Balanced output - 0dBu low impedance balanced output, with output gain settings.
- Record output - the conferencing output can be set via a jumper to give a mix of the caller and mic/line input signals for recording both sides of the telephone conversation.
- Line limiter, bandpass filter and output noise gate with preset threshold providing low distortion audio.
- Built in universal power supply between 90V AC and 250V AC, 47-63Hz, IEC mains input.
- ETSI approval compliant with European PTT specifications.

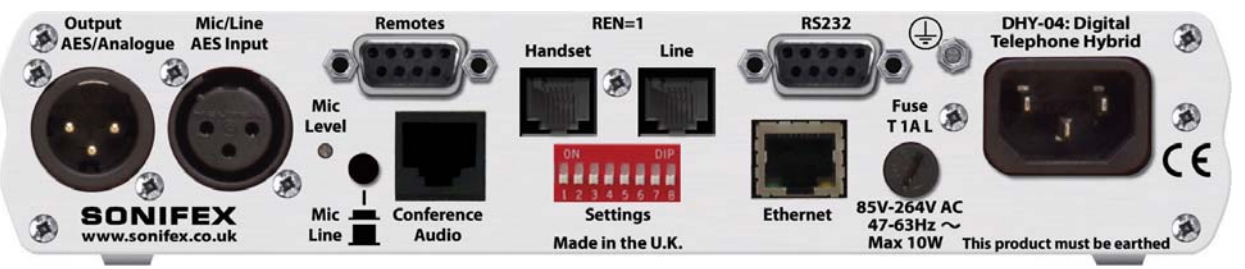
The DHY-04 Front & Rear Panels.

The Best Telephone Hybrid in the World Just Got Better!

The DHY-04 telephone hybrid is an enhanced redesign of the DHY-03, the best performing telephone hybrid in the world. It now has auto-sensing combined analogue and AES/EBU inputs and outputs, front panel speed dial buttons, together with an Ethernet interface to allow web browser access to the configuration and internal settings. All whilst still retaining stunning line balance rejection figures. For the best sounding audio calls you're likely to hear, you should specify the DHY-04. Key new features of the unit include:

- Auto-sensing combined analogue or AES/EBU XLR input.
- AES/EBU sample rates up to 24 bit/96kHz accepted.
- Configurable analogue or AES/EBU XLR output.
- Ethernet port for remote configuration via web browser GUI.
- Remote dialling and line hold control via Ethernet.
- Ethernet network interface can generate SNMP Traps for SNMP management systems.
- DTMF dial tone recognition for reporter remote access - a journalist can dial into the unit which can recognise a pre-programmed DTMF numeric password to automatically connect the journalist on-air.
- Four front panel speed-dial buttons for dialling internally preset phone numbers.
- Front panel Redial button for redialling the last number.

The DHY-04 Front Panel.



The DHY-04 Rear Panel.

The DHY-04S Front Panel.

The DHY-04S Rear Panel.

The DHY-04T Front Panel.

The DHY-04T Rear Panel.

DHY-04G
GSM Hybrid

DHY-04G Single Automatic GSM Hybrid, AES/EBU & Analogue I/O With Ethernet

Category: Digital Telephone Hybrids.
Product Function: Provides separation between send and receive signals on a 2G/GSM network, provides professional level balanced input & output signals and has echo cancellation.
Typical Applications: Radio & TV station outside broadcast vehicles for talk shows, telephony interface to the mixer. Backup hybrid to cover failure of main landline.
Features:

- Quad-Band EGSM 850 / 900 / 1800 /1900MHz.
- Rear panel 2G/GSM SIM card insertion.
- Ethernet web server control and configuration.
- Front panel speed dial buttons with redial.
- Signal strength LED display.
- LEDs for SIM enabled and GSM network availability.
- Automatic operation.
- Combined AES/EBU and analogue input and output.

A new addition to the DHY-04 range is the ability for the DHY-04G version to be used on a GSM cellular (mobile) phone network instead of a telephone (POTS) line. The DHY-04G can accept a SIM card in the rear panel slot and by connecting a suitable GSM antenna, the DHY-04G can receive and make high quality broadcast calls over the cellular network, converting the GSM call to the 4 wire audio signal to and from a connected mixing console. The GSM module used in the DHY-04G is quad-band GSM, so it can take and make calls on any 2G network.

Ideal for studios in remote locations, for OB vans and trucks on the move, and in emergency situations where a telephone landline can't be guaranteed, the DHY-04G offers outstanding performance.

The DHY-04G has all features of the DHY-04 (read cellphone/mobile features instead of telephony features in the listed bullet point specification) together with some additional front panel indicators. There are two LEDs, one for SIM enabled and one for GSM Network availability. Additionally there is a push button which allows the GSM signal level to be displayed on the meter LEDs.

The DHY-04G Front & Rear Panels.

DHY-04G Home Page.

DHY-04G Configuration Page.

The DHY-04G Front Panel.

The DHY-04G Rear Panel.

Which Format Is Most Suitable ?

The DHY-04G GSM hybrids are available in three models :

- DHY-04G Single free-standing GSM TBU.
- DHY-04GS Single 19” rack mounted GSM TBU.
- DHY-04GT Twin 19” rack mounted GSM TBU.

The DHY-04GS Front Panel.

The DHY-04GS Rear Panel.

The DHY-04GT Front Panel.

The DHY-04GT Rear Panel.

DHY-04HD
HD Voice Hybrid

DHY-04HD Single Automatic HD Voice & GSM Hybrid, AES/EBU & Analogue I/O With Ethernet

Category: Digital Telephone Hybrids.
Product Function: Provides separation between send and receive signals on a 2G/GSM network, provides professional level balanced input & output signals and has echo cancellation.
Typical Applications: Radio & TV station outside broadcast vehicles for talk shows, telephony interface to the mixer. Backup hybrid to cover failure of main landline.

Features:

- Five band UMTS/HSPA+850 / 900 / 1800 / 1900 / 2100MHz.
- Rear panel 2G GSM or 3G SIM card insertion.
- Ethernet web server control and configuration.
- Front panel speed-dial buttons with redial.
- Signal strength LED display.
- LEDs for SIM enabled and GSM network availability.
- Automatic operation.
- Combined AES/EBU and analogue input and output.

The DHY-04HD Front & Rear Panels.

The DHY-04HD HD Voice Hybrid is used on a 3G or GSM cellular (mobile) phone network instead of a telephone (POTS) line. The DHY-04HD can accept a SIM card in the rear panel slot and by connecting a suitable GSM antenna, it can receive and make high quality broadcast calls over the cellular network, converting the 3G or GSM call to the 4 wire audio signal to and from a connected mixing console. The module used in the DHY-04HD is quad-band GSM and 5 band UMTS/HSPA+, so it can take and make calls on any 2G GSM, or 3G network.

It is ideal for studios in remote locations, for OB vans and trucks on the move, and in emergency situations where a telephone landline can't be guaranteed, the DHY-04HD offers outstanding performance.

The DHY-04HD has all features of the DHY-04 together with some additional front panel indicators. There are two LEDs, one for SIM enabled and one for GSM Network availability. Additionally there is a push button which allows the mobile signal level to be displayed on the meter LEDs.

HD Voice:

HD Voice uses a coding system (also known as WB-AMR) for audio data that provides a significant enhancement on the quality of cellular phone calls. It is ideal for broadcasters and journalists providing a frequency response up to 7kHz (twice that of a normal GSM or POTS connection).

The use of HD Voice is dependent on 3 criteria:

1. The method has to be supported by the network, (and this may be limited by your contract), and when different networks are involved in the call, the interoperability between the networks.
2. The actual equipment used by both ends of the call must be HD Voice compatible. Both these requirements will be established on call connection, which leads to the third criteria.

The DHY-04HD Front Panel.

The DHY-04HD Rear Panel.

Which Format Is Most Suitable ?

The DHY-04HD HD Voice hybrids are available in three models :

- DHY-04HD Single free-standing HD Voice Hybrid.
- DHY-04HDS Single 19” rack mounted HD Voice Hybrid.
- DHY-04HDT Twin 19” rack mounted HD Voice Hybrid.

3. The signal quality can vary during the call. Normally the hybrid will be used in a fixed location (even OB trucks are normally stationary), so the position of the antenna can be refined for best signal quality. However the far end may be from a cellular phone, so may vary in quality and which can lead to dynamic bandwidth changes during a call. It is mostly true that network providers will only handle HD Voice on 3G networks though, in theory, it should aldo be compatible with enhanced 2G networks.

The DHY-04HDS Front Panel.

The DHY-04HDS Rear Panel.

The DHY-04HDT Front Panel.

The DHY-04HDT Rear Panel.

Specification For DHY-04, DHY-04G & DHY-04HD

Audio Specification Analogue Audio I/O		DHY-04	DHY-04G	DHY-04HD
Input Impedance - Line Mode (Clean Feed):	10kΩ balanced 0dB	Yes	Yes	Yes
Input Impedance - Conferencing:	10kΩ balanced 0dB	Yes	Yes	Yes
Input Impedance - Microphone Mode:	2kΩ balanced	Yes	Yes	Yes
Input Level Gain Range:	+6dB, 0dB, and -6dB adjusted by 3-position front panel switch, +10dB jumper	Yes	Yes	Yes
Microphone Level Gain Preset:	From 65dB to 35dB	Yes	Yes	Yes
Maximum Input Levels:	Line +26dBu, mic -24dBu	Yes	Yes	Yes
Clean Feed Limiting Input:	-4dBu for CTR21 setting, other values available *	Yes	Yes	Yes
Output Impedance - Line Out:	50Ω balanced floating 0dBu	Yes	Yes	Yes
Output Impedance - Conference/Record:	50Ω balanced floating 0dBu	Yes	Yes	Yes
Output Level Gain Range:	+6db, 0dB, and -6dB adjusted by 3-position front panel switch	Yes	Yes	Yes
Audio Specification Digital Audio I/O				
Input Impedance:	110Ω ±20% balanced	Yes	Yes	Yes
Output Impedance:	110Ω ±20% balanced	Yes	Yes	Yes
Sample Frequency Range:	30 - 100kHz (i.e. including 32kHz, 44.1kHz, 48kHz, 64kHz, 88.2kHz & 96kHz)	Yes	Yes	Yes
Signal Level:	2V/7V peak to peak min/max	Yes	Yes	Yes
Analogue Input Level for Full Scale Digits:	+18dBU	Yes	Yes	Yes
Maximum Input Level:	0dBFS but internally limited to -6dBFS	Yes	Yes	Yes
Maximum Output Level:	-6dBSFS	Yes	Yes	Yes
Telephone Line				
Bandwidth to Telephone Line:	250Hz - 4kHz, -3dB ref 1kHz	Yes	No	No
Telephone Line Impedance:	600Ω, 900Ω plus 14 other complex impedance circuits *	Yes	No	No
Rejection Ratio:	80-88dB on complex waveforms, reference peak level of 0dBFS	Yes	Yes	Yes
Ring Detector Sensitivity:	Off, 1, 2, 3, or 4 rings	Yes	Yes	Yes
GSM Connection				
Module Type:	Quad-Band EGSM 850 / 900 / 1800 /1900MHz	No	Yes	Yes
	5-band UMTS/HSPA+ 850 / 900 /1800 / 1900 /	No	No	Yes
	2100MHz	No	No	Yes
Output Power:	Class 4 (2W) @ 850 / 900MHz,	No	Yes	Yes
	Class 1 (1W) @ 1800 / 1900MHz	No	Yes	Yes
	Class 3 (0.25W 24dBm) @ UMTS	No	No	Yes
	Class E2 (0.5W 27dBm) @ EDGE 850/900	No	No	Yes
	Class E2 (0.4W 26dBm) @ EDGE 1800/1900	No	No	Yes
Sensitivity:	-107 dBm (typ.) @ 850 / 900MHz,	No	Yes	No
	-106 dBm (typ.) @ 1800 / 1900MHz	No	Yes	No
	-109 dBm (typ.) @ GSM 850 /900MHz	No	No	Yes
	-110 dBm (typ.) @ DCS1800 /PCS1900MHz	No	No	Yes
	-111 dBm (typ.) @ UMTS	No	No	Yes
Approvals:	Fully Type approved conforming with R&TTE, European - CE, GCF, North America - FCC, PTCRB, IC, Brazil - ANATEL	No	Yes	Yes
Power Supply				
Power to DHY-04, S & T	Universal 12W power supply: 90 to 250V AC; 47-63Hz; fused 1A	Yes	Yes	Yes

* These values are dependent on the actual country setting selected on the DHY-04

Connections		DHY-04	DHY-04G	DHY-04HD
Mic/Line/AES-EBU Input:	XLR 3 pin female, with push-button mic/line selection	Yes	Yes	Yes
Line/AES-EBU Output:	XLR 3 pin male	Yes	Yes	Yes
Telephone Line:	RJ11 6/4 socket	Yes	No	No
Telephone Handset/Instrument:	RJ11 6/4 socket	Yes	No	No
GSM Antenna:	SMA socket	No	Yes	Yes
Conferencing or Record Audio:	RJ45 socket	Yes	Yes	Yes
Remotes:	9-way D-type socket	Yes	Yes	Yes
Ethernet:	RJ45 socket	Yes	Yes	Yes
RS232 Serial:	9-way D-type socket	Yes	Yes	Yes
Power:	IEC mains (CEE22)	Yes	Yes	Yes

Accessories Order Code	Description
DHY-04CON	Front Panel Conversion Kit, DHY-04S to DHY-04
DHY-04SCON	Front panel conversion kit, DHY-04 free standing to DHY-04S 19" (48cm) rack-mount front
DHY-04TCON	Front panel conversion kit, DHY-04 or DHY-04S, to DHY-04T 19" (48cm) rack-mount front
DHY-04GCON	Front Panel Conversion Kit, DHY-04GS to DHY-04G
DHY-04GSCON	Front panel conversion kit, DHY-04G free standing to DHY-04GS 19" (48cm) rack-mount front
DHY-04GTCON	Front panel conversion kit, DHY-04G or DHY-04GS, to DHY-04GT 19" (48cm) rack-mount front
DHY-04HDCON	Front Panel Conversion Kit, DHY-04HDS to DHY-04HD
DHY-04HDSCON	Front panel conversion kit, DHY-04HD free standing to DHY-04HDS 19" (48cm) rack-mount front
DHY-04HDTCON	Front panel conversion kit, DHY-04HD or DHY-04HDS, to DHY-04HDT 19" (48cm) rack-mount front
DHY-04CONF	Conference Cable to Connect 2 x DHY-04(G or HD) Units

Physical Specification Order Code	Description	Height	Width	Depth*	Total Nett Weight	Total Gross Weight
DHY-04 (Raw):	Automatic digital telephone hybrid, free standing					
DHY-04G (Raw):	Automatic digital GSM hybrid TBU, free standing	4.5cm 1.8"	21.8cm 8.6"	17.5cm 6.9"	1.4kg 3lbs	2.2kg 4.8lbs
DHY-04HD (Raw):	Automatic digital HD hybrid TBU, free standing					
DHY-04, DHY-04G & DHY-04HD (Boxed):		6cm 2.4"	34cm 13.4"	27cm 10.6"		
DHY-04S (Raw):	Automatic digital telephone hybrid, rack mounted					
DHY-04GS (Raw):	Automatic digital GSM hybrid TBU, rack mounted	4.5cm (1U) 1.8" (1U)	48.3cm (19" rack width)	17.5cm 6.9"	1.45kg 3.2lbs	2.3kg 5lbs
DHY-04HDS (Raw):	Automatic digital HD hybrid TBU, rack mounted					
DHY-04S, DHY-04GS & DHY-04HDS (Boxed):		6.8cm 2.7"	58.8cm 23"	27cm 10.6"		
DHY-04T (Raw):	Twin automatic digital telephone hybrid, rack mounted					
DHY-04GT (Raw):	Twin automatic digital GSM hybrid TBU, rack mounted	4.5cm (1U) 1.8" (1U)	48.3cm (19" rack width)	17.5cm 6.9"	2.80kg 6.2lbs	4.4kg 9.7lbs
HY-04HDT (Raw):	Twin automatic digital HD hybrid TBU, rack mounted					
DHY-04T, DHY-04GT & DHY-4HDT (Boxed)		6.8cm 2.7"	58.8cm 23"	27cm 10.6"		

*Depth is measured from the front to the end of the connectors fitted to the back of the unit.

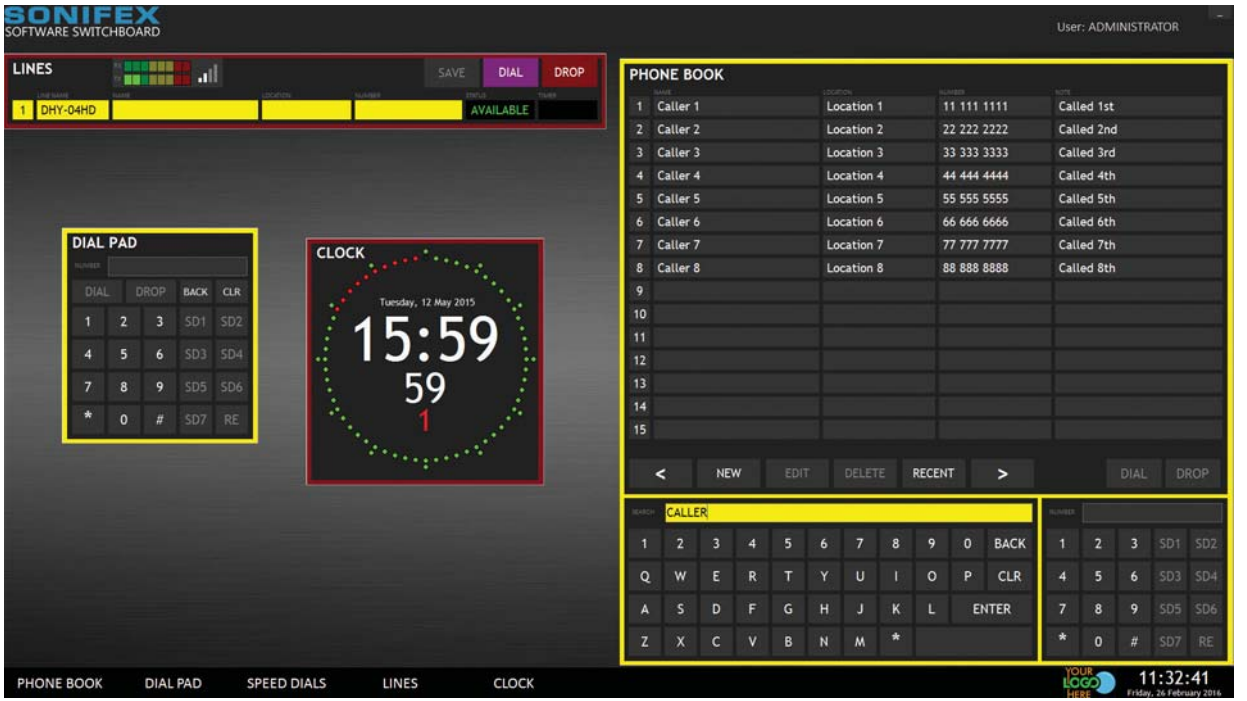
Free Sonifex Switchboard Software - Remote Control of DHY-04/G/HD Hybrids

Software for remote control of the DHY-04 range of digital telephone hybrids is available for download free of charge. The software runs on Windows 7/8/10 and allows the control of up to 24 digital hybrids, including the GSM (DHY-04G) and HD Voice (DHY-04HD) versions of the products, all from one screen.

The software includes a Phone Book, a Chat Screen, Speed Dials, a Dial Pad and a Broadcast Clock.

It uses a local or networked SQL database for shared access to the hybrids and the interface is designed for use with a Full HD resolution touchscreen, although it can be used with traditional mouse and keyboard inputs.

To download, please go to the Software Downloads section of the Sonifex website.



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