DDXi
digital, modular KVM-Extender
for VGA/DVI - cabel length < 10km,
max. resolution 1600x1200@60Hz

deutsch

Dear customer,

congratulations to purchase the DDXi KVM-extender. This product corresponds to the ultimate requisitions for quality and technics. If you still have problems with your device, please refer to your sales office.

Please read this manual before installing and operating the units. Please record the serial number, the date of purchase and your sales office in the space below. The serial number is located on the rear side of the units. These data would be important, if you ever need to repair one of the parts. Retain this Owners Manual in a safe place for future reference.

Serial number . . . . . .

Date of purchase . . . . . .

Sales office

Introduction

Note: This manual describes several, different products. There may be connectors or parts described, which are not installed in your unit. See page 40/, to find the matching interfaces for your device. A list of available devices you may find on page .

Important Notice:

If you use this device with a DVI screen at a DVI signal source, you will immediately see - without any adjustments - the perfect screen quality. You will not see any difference to a screen, plugged directly into the CPU.

But if you use this device with a CPU with VGA card and/or you have a VGA screen at the end of the line (also if you have a flat screen with VGA connector) there might be a unsatisfying ´screen result. This is not a defect of our device, but regular a missing or wrong adapted setup: Like a flat screen (TFT) which is connected directly to a VGA card in a CPU, our device needs to be adopted to the signals of the VGA card. Both, TFT and DDXi digitize the graphic signal and transmit the measured values as digits. To get a best possible display, the measurement must be done in the middle of each pixel. Therefore the count of pixels in each line and the position within each pixel (phase) must be known. These values are determined during the setup. If you use our device on a VGA card, you need to setup our device first. Please use for the setup a CRT screen because a double digitizing in the device and the screens makes a correct setup difficult. Please refer to our Setup Instruction on page 52. If you use a TFT screen with VGA cable at the far end, you need to setup the TFT after setting up our device. How to do this is described in the manual of your TFT. If you use a TFT screen with VGA cable at the far end and connect the local unit to a DVI card, you need only to setup the TFT screen. If possible, please use the automatic setup function of your TFT and a proper setup picture (s.a. -> Setup Instructions page 52)

DDXi – The Future of KVM Extension
With Flat panel displays becoming more prevalent it is natural to drive them digitally through their DVI interface to obtain optimum image quality. DDXi supports DVI extension up to resolutions of 1600 x 1200 to ensure the benefits of using DVI are maintained even if you locate your monitor 10 km away!

VGA, DVI and more
DDXi supports traditional analog VGA as well as digital DVI. All combinations of DVI and VGA (graphics cards and monitors) are supported, allowing equipment to be mixed. You could use DDXi today to extend (with perfect image quality) your existing SVGA equipment. If you later purchase a DVI monitor you can use it with DDXi even though your computer is equipped with a VGA graphic card. When you finally upgrade to a DVI graphic card, DDXi will continue to extend your system without any reconfiguration.

Flexibility
DDXi has a modular architecture providing superb flexibility. Not only are all standard peripheral connections supported (PS2, SUN) but also the different cabling interfaces (depending

on model) for bridging the required distance: Use Cat5 network cable, Multi-mode or Single-mode fibre cables. Other interfaces may also be added such as Serial Port for Touch-Screen, Stereo Audio, Base-Band Video Transmission[1], USB, 10BaseT Network Management[2], Parallel Port or other custom interfaces[3].

The features in the overview

Depending on the type of device, you can connect monitors with a resolution of up to 1600x1200 pixels. You can use PS2 Mouse and Keyboard, SUN Keyboard/Mouse or USB Devices. The high dense packing of the electronic components allow, to mount this in a slim, tight housing, which can be placed on the table, as well as mounted at a wall as well as stacked in a 19" Housing. Bridging the distance with a Cat5 cable (used with a 10BaseT network), you can bridge at least 100m (app. 330ft). Using only 2 fibers of a fiber optical cable (i.e. FOIRL from fiber networking or Fiber To The Desk, ...) you can bridge 200m (app. 650ft) with a 62.5 micron fiber and up to 400m (app. 1310ft) with a 50 micron fiber. If you use single mode fibers/devices, you can extend the distance up to 10km (app 6 1/4 miles) without any reboosting! Using fiber devices, you do not only have the advantage of extended cable length, but your line is also absolutely inaffected by electromagnetic interferences (EMI). You have electromagnetic protection against lightnings and overvoltage. And last but not least, it is absolutely sure against any spy attack.

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The external power supply has to be connected at the plug terminal on the outside of both interface boxes. It is a autosensing AC/DC converter, using any voltage in the range between 90 and 240 Volts at 50 or 60 Hz.

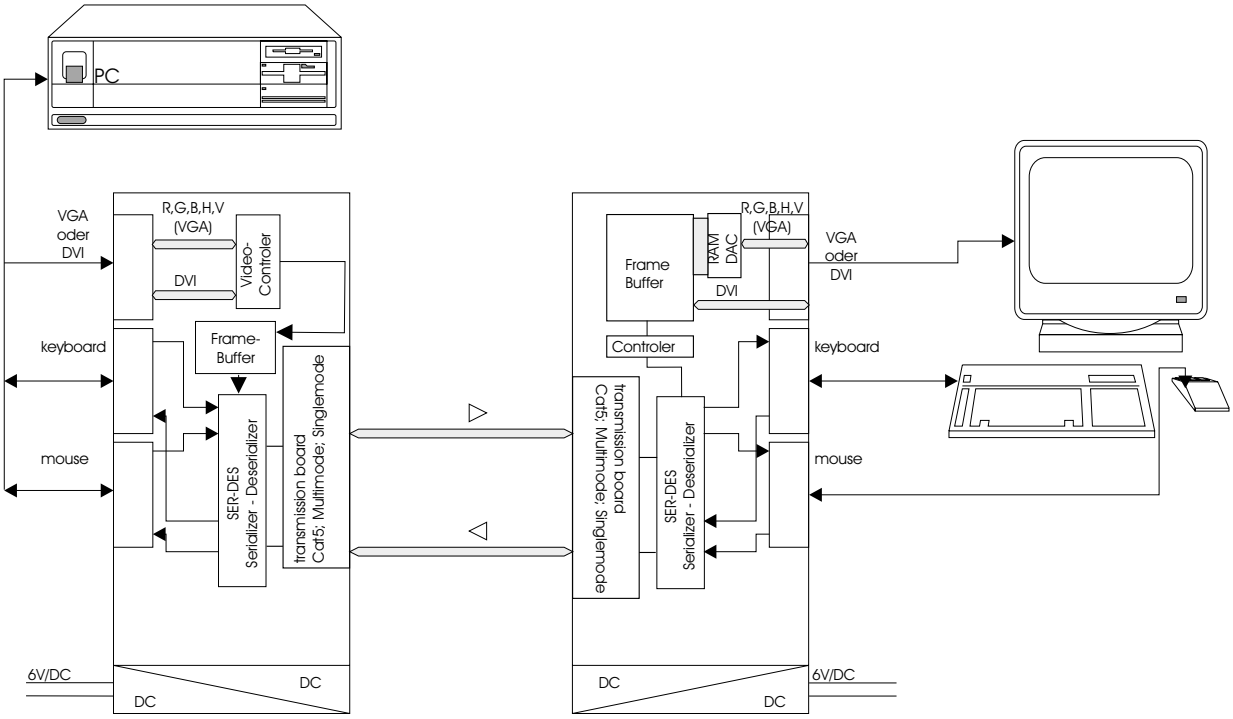

fig: 2 - schematic installation arrangement

1 (in preparation)
2 (in preparation)
3 (in preparation)

Specifications

Power supply

Voltage	:	p.s.u.: 90..240VAC-0,5A-47..63Hz/6VDC-2000 mA	
Power required	:	local interface	app. 8 W
		remote interface without keyboard	app. 8 W
		remote interface with keyboard	app. 9.5 W

Interface (depending on type of device)

monitor	:	VGA (res.: 1600x1200@60Hz, plug&play supported) all lower resolutions at least with 75Hz
local access	:	max. resolution VGA: 1600x1200, DVI: 1280x1024
Single Link	:	DVI (res.: 1600x1200@60Hz, plug&play supported)
keyboard/mouse	:	IBM PS2 (power consumption <100mA)
keyboard/mouse	:	SUN compatible
USB	:	USB 1.1 compatible (**NO** CD-Writer!)

maximum length of interconnection cable (without reboost)

Cat5/5e/6/7	:	100m (solid cable 4x2xAWG24 or AWG23)
Cat5/5e/6/7	:	60m (stranded cable 4x2xAWG26)
62.5µm/50µm Multimode	:	200m@62,5µ (app. 650 ft) / 400m@50µ (app. 1310 ft)
9µm Singlemode	:	10km (app. 6 1/4 miles)

Dimensions

Weight	:	app. 1,0 kg
Length/width/hight	:	app. 170 x133 x 44mm
Temperature range	:	running: app. 10°C ... 45°C storage: app. -5°C ... 55°C
Humidity	:	max. 80% - non condensing

Highlights

Working on both: VGA or DVI: The units are designed, to work with a VGA- or a DVI-graphic card without any modification, even you may connect a VGA- or DVI- monitors to the units as they are. **Future proof your investment!** You could use DDXi today to extend (with perfect image quality) your existing SVGA equipment. If you later purchase a DVI monitor you can use it with DDXi even though your computer is equipped with a VGA graphic card. When you finally upgrade to a DVI graphic card, DDXi will continue to extend your system without any reconfiguration.

OSD - On Screen Display: You can comfortable adjust all necessary device parameters through a OSD. Personal selections of color temperature, brightness, contrast, saturization, ... are to be modified as well as the adaption to analogue signal sources (VGA/RGB). See also -> Setup Instructions page 52.

optical elements (Multimode)

The used multimode transceivers are Class 1 laser products. They comply with IEC 825-1 and FD 21 CFR 1040.10 and 1040.11. To meet laser saftey requirements the transceivers shall be operated within the maximum ratings.

Caution

The use of optical instruments with this product will increase eye hazards! All adjustments have been made at the factory prior to shipment of the device. No maintenance or alteration to the device is required.
Tampering with or modifying the performance of the device will result in voided product warranty.

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Usage restrictions

The optical ports of the modules must be terminated with a optical connector or with a dust plug.

Note
Failure to adhere to the above restrictions could result in a modification that is considered an act of "manufactoring," and will require, under law, recertification of the modified product with the U.S. Food and Drug Administration (ref. 21 CFR 1040.10 (i)).

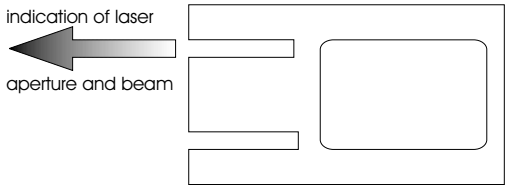
Laser Data

Wavelength	850 nm
Total output power (as defined by IEC: 50mm aperture at 10cm distance)	<400µW
Total output power (as defined by FDA: 7mm aperture at 20cm distance)	<70µW
Beam divergence	12°

Required labels

FDA	IEC
Complies with 21 CFR 1040.10 and 1040.11	Class 1 Laser Product

Laser emission



Transmitter Electro-Optical Characteristics (typical)

Launched Power (Average) into multimode fiber 50µm or 62.5 µm diameter	-5 dBm (-9,5 dBm min)
Center Wavelength	850 nm

Receiver Electro-Optical Characteristics (typical)

Sensitivity (Average Power)	-20 dBm (-17dBm max)

optical elements (Singlemode)

The used singlemode transceivers are Class 1 laser products. They comply with IEC 60825-1 and FDA 21 CFR 1040.10 and 1040.11. To meet laser saftey requirements the transceivers shall be operated within the absolute maximum ratings.

Caution

The use of optical instruments with this product will increase eye hazards! All adjustments have been made at the factory prior to shipment of the device. No maintenance or alteration to the device is required.
Tampering with or modifying the performance of the device will result in voided product warranty.

Usage restrictions

The optical ports of the modules must be terminated with a optical connector or with a dust plug.

Note
Failure to adhere to the above restrictions could result in a modification that is considered an act of “manufactoring,” and will require, under law, recertification of the modified product with the U.S. Food and Drug Administration (ref. 21 CFR 1040.10 (i)).

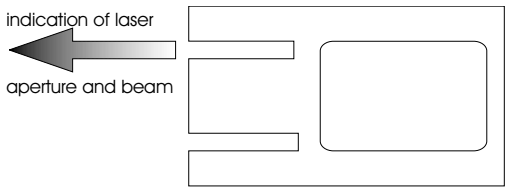
Laser Data

Wavelength	1300 nm
Total output power (as defined by IEC: 50mm aperture at 10cm distance)	<2000µW
Total output power (as defined by FDA: 7mm aperture at 20cm distance)	<180µW
Beam divergence	4°

Required labels

FDA	IEC
Complies with 21 CFR 1040.10 and 1040.11	Class 1 Laser Product

Laser emission



Transmitter Electro-Optical Characteristics (typical)

Launched Power (Average) into singlemode fiber 9µm diameter	-3 dBm (-11 dBm min)
Center Wavelength	1300 nm

Receiver Electro-Optical Characteristics (typical)

Sensitivity (Average Power)	-22 dBm (-20dBm max)

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Connecting cables and power supply

Connecting cables

Cat5 Modules: S/UTP (Cat5) cable acc. to EIA/TIA 56A or TSB 36 or Digital STP 17-03170. Four pairs AWG 24. Pinout acc. EIA/TIA 568A (10BaseT). Screen mut be connected on both ends. To enhance EMI proerties, both end should carry a ferrite near to the connectors. Please be careful to have a tension free connection!.

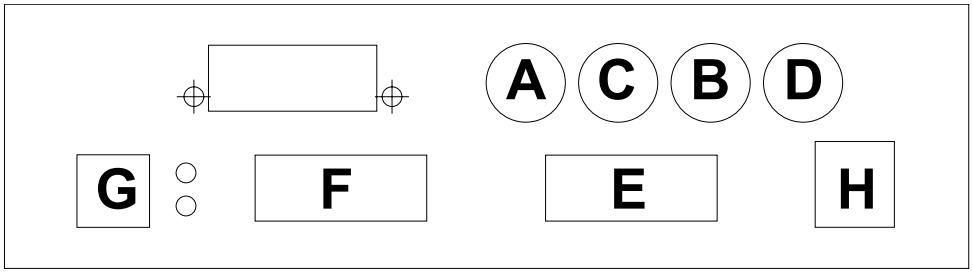
Multimode Modules: Two fibers 50µm or 62.5µm. E.g. I-V(ZN)H 2G50 (Inhouse patchcable) or I-V(ZN)HH 2G62,5 (Inhouse Breakout cable) or I/AD(ZN)H 4G50 (inhouse OR outdoor Breakout cable, stress resistant) or A/DQ(ZN)B2Y 4G62,5 (outdoor cable, stress resistant with protection against animal biting) All notations acc. VDE specification.

Singlemode Modules: Two fibers 9µm. E.g. I-V(ZN)H 2E9 (Inhouse patchcable) or I-V(ZN)HH 2E9 (Inhouse Breakout cable) or I/AD(ZN)H 4E9 (inhouse OR outdoor Breakout cable, stress resistant) or A/DQ(ZN)B2Y 4G9 (outdoor cable, stress resistant with protection against animal biting) All notations acc. VDE specification.

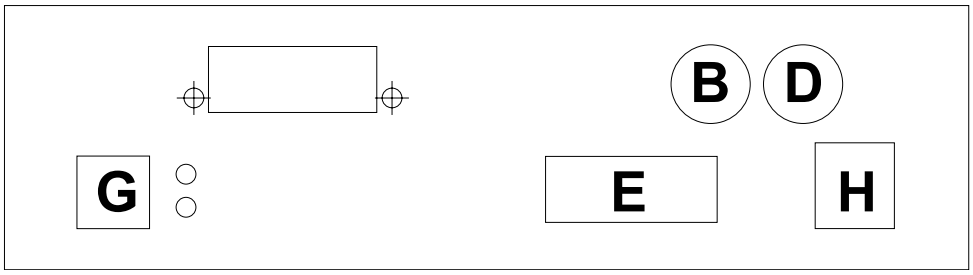
Power Supply Socket
At the plug terminal on the outside of both interface boxes a direct current power supply with 6 V/DC has to be connected. We recommend to use our suggested p.s.u. because GND and EARTH shouln't be connected. Please mount near to the devices ferrite rings in the DC line, to protect against electromagnetic interferences.

Plug connectors of the local interface

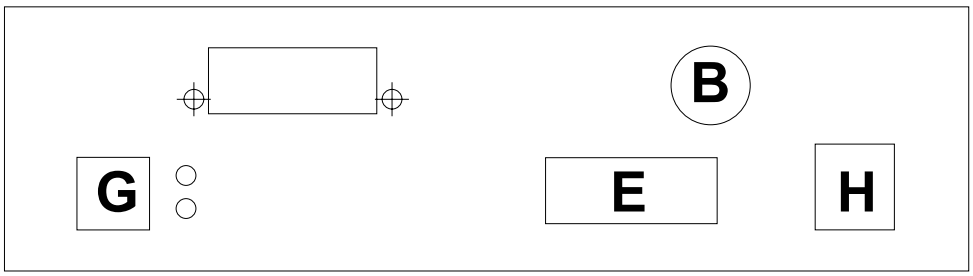
location of connectors at local unit PS2 type with local access:



location of connectors at local unit PS2 type without local access:



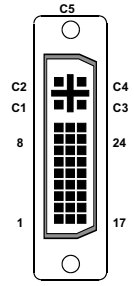
location of connectors at local unit SUN type:



connector	**PS2 w/ local access**	**PS2 w/o local access**	**SUN**
A	MOUSE OUT		
B	MOUSE IN	MOUSE IN	KEYBOARD/MOUSE IN
C	KEYBOARD OUT		
D	KEYBOARD IN	KEYBOARD IN	
E	DVI/VGA IN	DVI/VGA IN	DVI/VGA IN
F	DVI/VGA OUT		
G	POWER	POWER	POWER
H	PROGRAMMING	PROGRAMMING	PROGRAMMING

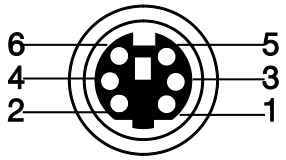
pinout local connectors

(depends on type of device!)



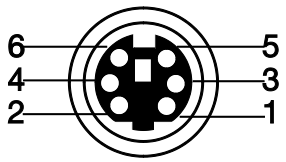
DVI/VGA IN/OUT
DVI-I connector

1- T.M.D.S data 2-	11- T.M.D.S data 1 GND	21- n.c.	
2- T.M.D.S data 2+	12- n.c.	22- T.M.D.S clock GND	
3- T.M.D.S data 2 GND	13- n.c.	23- T.M.D.S clock +	
4- n.c.	14- +5V Power	24- T.M.D.S clock -	
5- n.c.	15- GND	C1- analogue Red	
6- DDC Input (SCL)	16- Hot Plug recognition	C2- analogue Green	
7- DDC Output(SDA)	17- T.M.D.S data 0-	C3- analogue Blue	
8- Analogue VSYNC	18- T.M.D.S data 0+	C4- analogue HYSNC	
9- T.M.D.S data 1-	19- T.M.D.S data 0 Masse	C5- analogue GND	
10- T.M.D.S data 1+	20- n.c.		



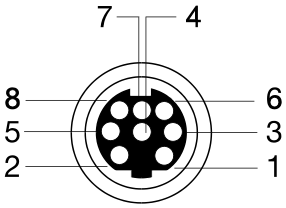
MOUSE IN/OUT
6p miniDIN female

1- MOUSE DATA	4- monitor/+5V
2- n.c.	5- MOUSE CLOCK
3- GND	6- n.c.



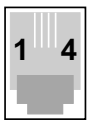
KEYB IN/OUT
6p miniDIN female

1- KEYBOARD DATA	4- monitor/n.c.
2- n.c.	5- KEYBOARD CLCK
3- GND	6- n.c.



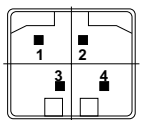
SUN KEYB/MOUS
8p miniDIN female

1- GND	5- KEYBOARD OUT
2- GND	6- KEYBOARD IN
3- SUN Power ON	7- KEYBOARD Power ON
4- MOUSE IN	8- SUN Power ON



PRGRAMMING
RJ11 jack 4p4c

1 - TxD (to PC RxD)	1- GND
2 - RxD (from PC TxD)	2- Earth
3 - DTR from PC	3- n.c.
4 - Masse (GND)	4- +6VDC
	Housing Shield



POWER
4pin Hirose

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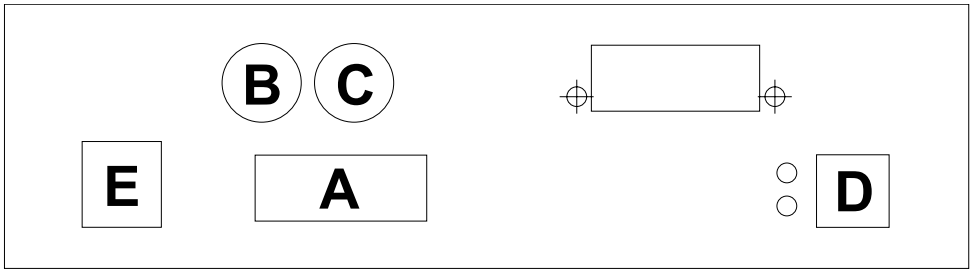
Plug connectors of the remote interface

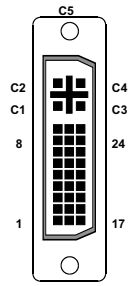
location of connectors at remote unit PS2 type and SUN type:



connector	PS2	SUN
A	DVI/VGA OUT	DVI/VGA OUT
B	MOUSE OUT	KEYB/MOUSE IN
C	KEYBOARD OUT/PRG	PRG
D	POWER	POWER
E	PROGRAMMING	PROGRAMMING

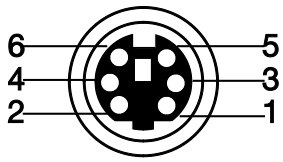
pinout remote connectors

(depends on type of device!)



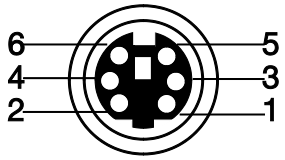
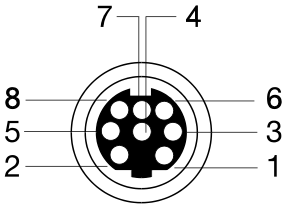
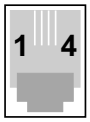
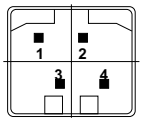
DVI/VGA OUT
DVI-I connector

1-	T.M.D.S data 2-	11-	T.M.D.S data 1	21-	n.c.
2-	T.M.D.S data 2+		GND	22-	T.M.D.S clock GND
3-	T.M.D.S data 2	12-	n.c.	23-	T.M.D.S clock +
	GND	13-	n.c.	24-	T.M.D.S clock -
4-	n.c.	14-	+5V Power	C1-	analogue Red
5-	n.c.	15-	GND	C2-	analogue Green
6-	DDC Input (SCL)	16-	Hot Plug recognition	C3-	analogue Blue
7-	DDC Output(SDA)	17-	T.M.D.S data 0-	C4-	analogue HYSNC
8-	Analogue VSYNC	18-	T.M.D.S data 0+	C5-	analogue GND
9-	T.M.D.S data 1-	19-	T.M.D.S data 0		
10-	T.M.D.S data 1+		Masse		
		20-	n.c.		



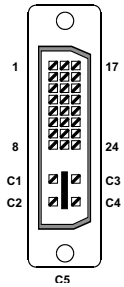
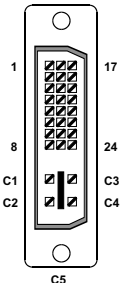
MOUSE OUT
6p miniDIN female

1-	MOUSE DATA	4-	monitor/+5V		
2-	n.c.	5-	MOUSE CLOCK		
3-	GND	6-	n.c.		

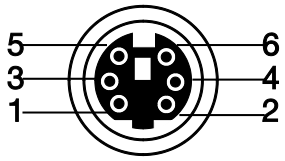
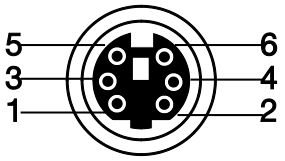
 KEYB OUT 6p miniDIN female	1- KEYBOARD DATA 2- n.c. 3- GND	4- monitor/n.c. 5- KEYBOARD CLCK 6- n.c.	
 SUN KEYB/MOUS 8p miniDIN female	1- GND 2- GND 3- SUN Power ON 4- MOUSE IN	5- KEYBOARD OUT 6- KEYBOARD IN 7- KEYBOARD Power ON 8- SUN Power ON	
 PRGRAMMING RJ11 jack 4p4c	1 - TxD (to PC RxD) 2 - RxD (from PC TxD) 3 - DTR from PC 4 - Masse (GND)	1- GND 2- Earth 3- n.c. 4- +6VDC Housing Shield	 POWER 4pin Hirose

pinout cables

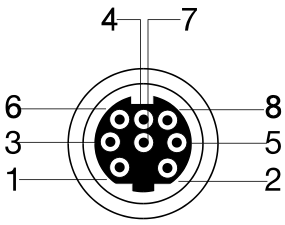
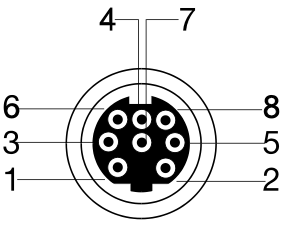
PC-cable DVI/VGA (DVI-I)

 CPU side DVI-I male	1- T.M.D.S data 2- 2- T.M.D.S data 2+ 3- T.M.D.S data 2 GND 4- n.c. 5- n.c. 6- DDC Input (SCL) 7- DDC Output(SDA) 8- Analogue VSYNC 9- T.M.D.S data 1- 10- T.M.D.S data 1+	11- T.M.D.S data 1 GND 12- n.c. 13- n.c. 14- +5V Power 15- GND 16- Hot Plug recognition 17- T.M.D.S data 0- 18- T.M.D.S data 0+ 19- T.M.D.S data 0 Masse 20- n.c.	21- n.c. 22- T.M.D.S clock GND 23- T.M.D.S clock + 24- T.M.D.S clock - C1-analogue Red C2-analogue Green C3-analogue Blue C4-analogue HYSNC C5-analogue GND	 local Interface DVI-I male

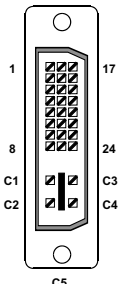
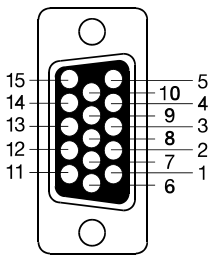
PS2 keyboard/mouse cable

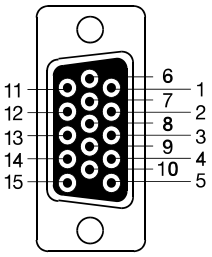
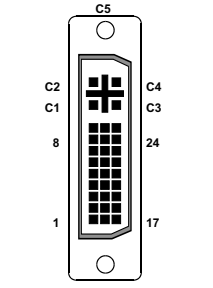
 CPU side 6p miniDIN male	1- KEYB/MOUSE DATA 2- 3- GND	4- +5V 5- KEYB/MOUSE CLCK 6-	 local Interface 6p miniDIN male

SUN keyboard/mouse cable

 SUN CPU side 8p miniDIN male	1- GND 2- GND 3- SUN Power ON 4- MOUSE IN	5- KEYB OUT 6- KEYB IN 7- KEYB Power ON 8- SUN Power ON	 local Interface 8p miniDIN male

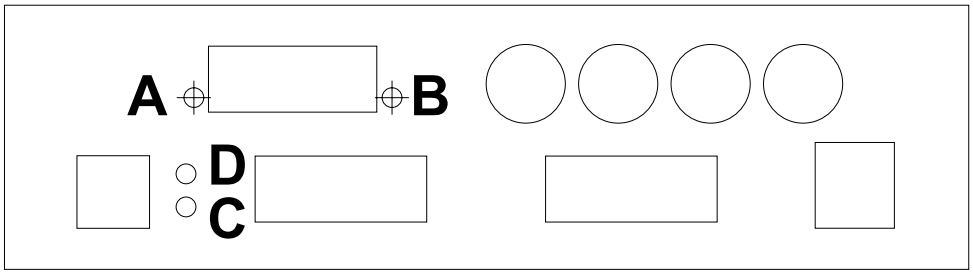
DVI/VGA-Adapter

 remote Interf. DVI-I male	6- DDC Input (SCL) 7- DDC Output(SDA) 8- analogue VSYNC C1-analogue Red C2-analogue Green C3-analogue Blue C4-analogue HYSNC C5-analogue GND	---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------	15- DDC Input (SCL) 12- DDC Output(SDA) 14- analogue VSYNC 1- analogue Red 2- analogue Green 3- analogue Blue 13- analogue HYSNC 6,7,8- analogue GND	 to Monitor HD15 female

 CPU side HD15 male	15- DDC Input (SCL) 12- DDC Output(SDA) 14- analogue VSYNC 1- analogue Red 2- analogue Green 3- analogue Blue 13- analogue HYSNC 6,7,8- analogue GND	---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------	6- DDC Input (SCL) 7- DDC Output(SDA) 8- analogue VSYNC C1-analogue Red C2-analogue Green C3-analogue Blue C4-analogue HYSNC C5- analogue GND	 loc. Interface DVI-I female

Diagnostics

local unit



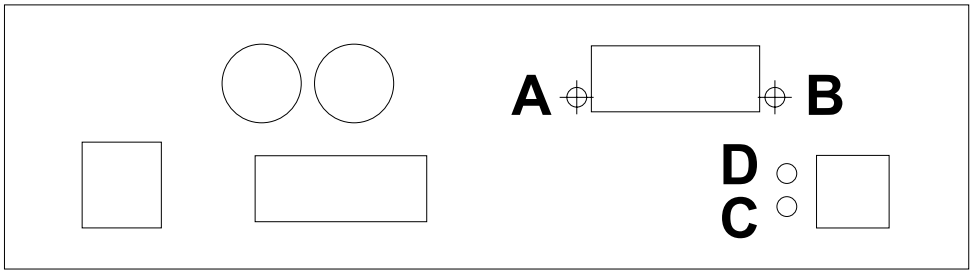
A **Communication Error** (red LED)
off: no communication error
slow blinking: one or some few communication errors occu red during the last 60 minutes
fast blinking a lot of communication errors occu red during the last 60 minutes.
(60 minutes after the last communication error occured, the error counter is cleared automatically)

B **Link Status** **(green LED)**
continuosly illuminated: link connection is locked
blinking: interconnection cable not connected or not OK

C **device ready**

D **Videosignal attached and valid Mode detected (green LED)**

remote Interface



A **Communication Error** (red LED)
off: no communication error
slow blinking: one or some few communication errors occu red during the last 60 minutes
fast blinking a lot of communication errors occu red during the last 60 minutes.
(60 minutes after the last communication error occured, the error counter is cleared automatically)

B **Link Status** **(green LED)**
continuosly illuminated: link connection is locked
blinking: interconnection cable not connected or not OK

C **device ready**

D **Videosignal attached and valid Mode detected (green LED)**

Device Control - OSD (On Screen Display)

All device parameters may be setup and stored comfortably with a On-Screen-Display (OSD). Persnal adjustments of colour temperature, brightness, contrast, saturization, ... may be stored as well, as you can do through this menue the adjustments for analogue signal sources.

Using DVI-Signals, you normally need not to adjust anything for a optimal screen quality! Anyway you can set per OSD brightness, contrast, saturization, ... to your delight.

To use the OSD, connect a standard PS2 keyboard at the remote unit. Connect the local unit to the PC.

To access to the OSD, you have to type in a key sequence at the remote end. While the OSD is active, the LED's at the keyboard are blinking, the mouse is blocked and only menue-keystrokes are allowed. Factory setting for popping up the OSD is:

(in some country specific layouts 'ctrl' is 'strg')

Within the OSD you can use only the following keys:

Key	Menue function	Action
	Menue selection	Close the OSD, release keyboard and mouse
	Adjusting parameters	Close the OSD, release keyboard and mouse
		Back to the Menue selection
	Menue selection	Select the Menue funtion
	Adjusting parameters	Accept the Menue setting/Start the Menue funtion
	Menue selection	Select the previous Menue selection/Menue funtion
	Adjusting parameters	decrease the selected parameter
	Menue selection	Select the next Menue selection/Menue funtion
	Adjusting parameters	increase the selected parameter

Values, to be increased/decreased are shown as bars., i.e.:

contrast

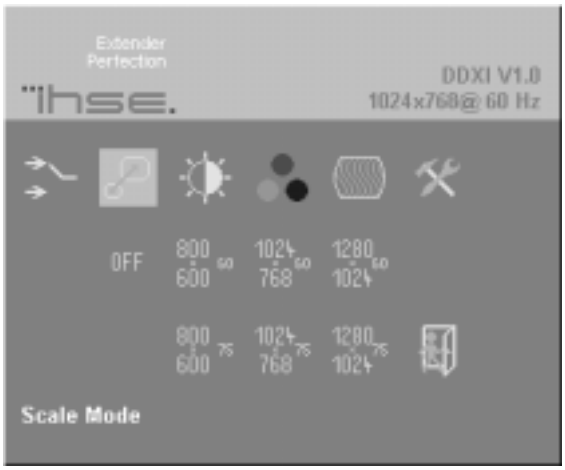
OSD-Functions

Select graphic source

The first menue when the OSD pops up is the selection of the graphic source. The actual resolution (1280x1024) and the vertical refresh rate (60,2Hz) is displayed. The actual graphic source is displayed with a 'checked' symbol (VGA ✓)

VGA	Selection: VGA is graphic source
DVI	Selection: DVI is graphic source
	Back to Menue selection

Select fixed screen resolution/scale mode



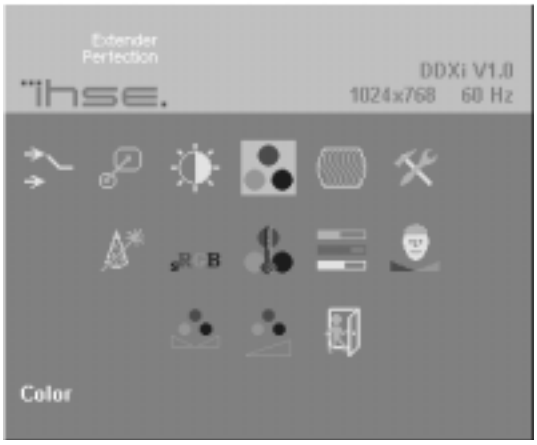
This device is to be set up for a transparent transmission. In this case, the remote unit generates screen resolution and refresh rate in exact the same manner, as the video source generates. But it is also able, to generate a fixed screen resolution, regardless, which resolution/refresh rate the graphic card has. You could use this fixed resolution, i.e. if your monitor is not able to display the generated resolution, or - if you have a server farm with many different CPU's, each having a different screen resolution. Then it may take a long time to regain a picture on the screen after each switching. Fixing the resolution fixes this problem.

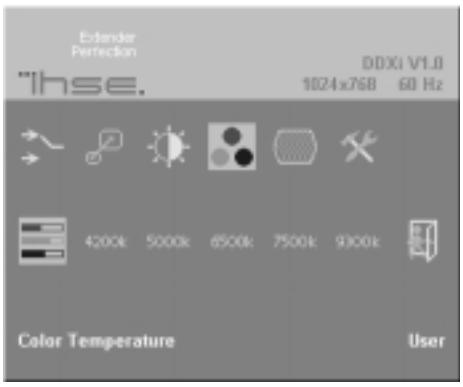
OFF	Transparent transmission: No modification on resolution/refresh rate, remote unit always generates an exact reproduction of the source signal
800 × 600 60	Fixed resolution at remote unit: 800x600, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 60Hz, this fits best for LCD'S (flat-screens)
1024 × 768 60	Fixed resolution at remote unit: 1024x768, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 60Hz, this fits best for LCD'S (flat-screens)
1280 × 1024 60	Fixed resolution at remote unit: 1280x1024, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 60Hz, this fits best for LCD'S (flat-screens)
800 × 600 75	Fixed resolution at remote unit: 800x600, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 75Hz, this fits best for CRT'S (tube-screens)
1024 × 768 75	Fixed resolution at remote unit: 1024x768, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 75Hz, this fits best for CRT'S (tube-screens)
1280 × 1024 75	Fixed resolution at remote unit: 1280x1024, regardless of the source signals resolution/refresh rate. The refresh rate is fixed to 75Hz, this fits best for CRT'S (tube-screens)
	Back to Menue selection

Select brightness/contrast

	select brightness
	select contrast
	select back level
	Back to Menue selection

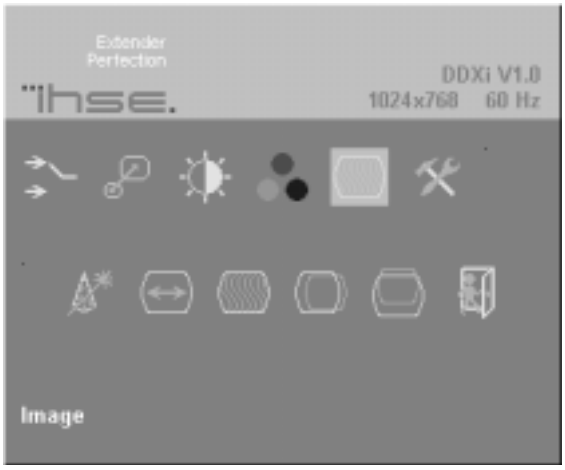
select colours and colour temperatures





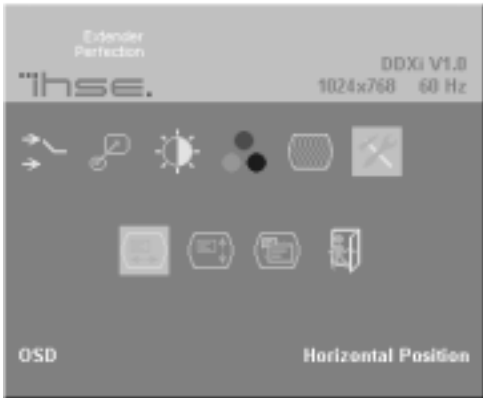
	automatic calibration of the best colour parameters		
	standard RGB selection		
	select colour temperature		
		direct setup of each colour in the RGB colour space. Modifying the colors here will automatically adjust the matching values in the CMY colour space.	
	 ...		select a setting, which corresponds to the selected colour temperature
	direct setup of each colour in the CMY colour space. Modifying the colors here will automatically adjust the matching values in the RGB colour space.		
	Flesh Tone / Skin Tone		
	Hue		
	Saturation		
	Back to Menue selection		

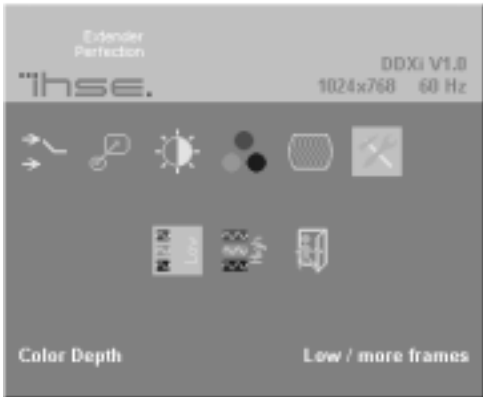
Select parameters of screen position (only selectable with VGA-source)



	Automatic detection of the number of pixels per line and the best phase (best point for A/D conversion within each pixel) see also See also -> Setup Instructions page 52
	manually adjust the number of pixels per line (Pixelclock)
	manually adjust the best Phase (best point for A/D conversion within each pixel)
	manually adjust the horizontal screen position
	manually adjust the vertical screen position
	Back to Menue selection

Select the parameters of the OSD, Factory Reset



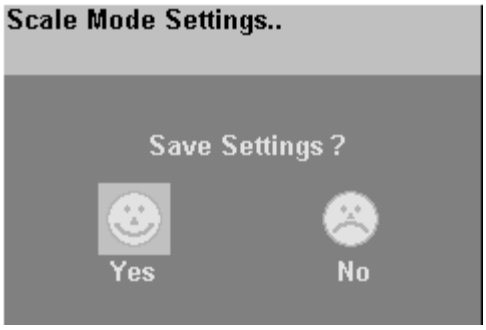


	Select OSD settings	
		manually adjust the horizontal OSD position
		manually adjust the vertical OSD position
		OSD size: select single size / double size
	Reset to factory settings	
	Sharpness: Only with eefect on fixed scaling. If you select a fixed screen resolution, due to resizing the original picture, some characters might be displayed not very sharp. With this function you may enhance the sharpness in three steps.	
	Selection, whether each mode change (changing screen resolution and/or refresh rate of the graphic source) will cause an 'Automatic detection of the number of pixels per line and the best phase' or not. An 'automatic detection of the number of pixels per line and the best phase' after each mode change will better ensure a well adjusted screen picture, but it takes a long time after each change in resolution and/or refresh rate until you get a picture on the screen. If you need to get the screen picture faster (i.e. switching a ServSwitch in a server room) and you can accept a small unsharpness (which you can naturally manually adopt at each time) it is better to deselect this feature.	
		Select 'automatic detection of the number of pixels per line and the best phase' after each mode change
		Deselect 'automatic detection of the number of pixels per line and the best phase' after each mode change
	Select the colour depth ot the transmitted screen picture data. The data may be transferred in High colour mode or low colour mode. High colour mode normally causes less frames per second (fps) - low colour mode causes more fps.	
		Select low colour mode: Transmitting on Cat5 with 5 bits/colour (=15 bits total = 32768 colours), transmitting on Fiber with 6 bits/colour (=1 8bits total = 262144 colours). This mode allows high frame rates: select this, if you need to display fast screen changes (i.e. video)
		Select high colour mode: Transmitting on Cat5 with 7 bits/colour (=21 bits total = 2.1 Mio colours), transmitting on Fiber with 8 bits/colour (=24 bits total = 16.78 Mio colours). This mode allows low frame rates only: select this, if you need to display exact pictures (i.e. medical applications)
	Back to Menue selection	

On some settings, the user may decide, whether he wil keep or discard the modifications:

Keep the modifications			Discard the modifications

i.e.:



Setup Instructions

You need to follow these Setup Instructions if you:

- want to drive on our remote unit a TFT- (flat panel) monitor with VGA-cable and the CPU has a DVI graphic card. In this case, please follow the instructions of your monitor manual.
- want to drive on our remote unit any monitor with VGA- cable and the CPU has a VGA graphic card. Please follow the steps, described below, to setup our device. Afterwards - if you have a TFT - follow the instructions of your monitor manual to setup your TFT screen.
- want to drive on our remote unit a TFT- (flat panel) monitor with DVI-cable and the CPU has a VGA graphic card. Please follow the steps, described below, to setup our device, the monitor needs not to be setup.
- want to drive on our remote unit a TFT- (flat panel) monitor with DVI-cable and the CPU has a DVI graphic card, then you need not to do any setup, you always have the best settings.

Before doing a automatic or manual adjustment, you need to display an appropriate picture on the attached screen. In this picture there should be a 'burst-pattern' over the whole screen. A burst is a picture with alternating, 1 pixel wide black and white, vertical stripes. If you do not have such a test pattern, please follow these instructions:

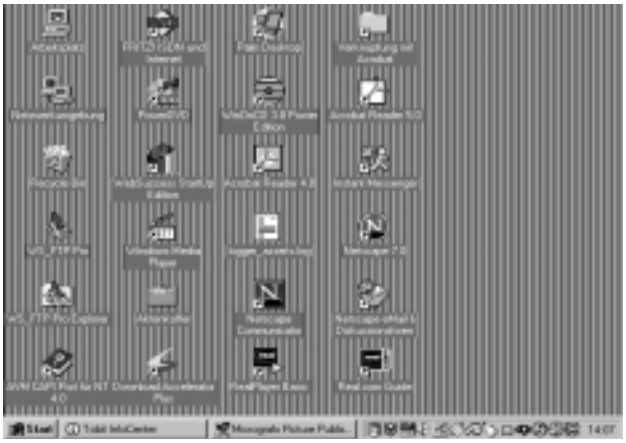
- Download the test pattern from our web server: http://www.ihse.de/images/burst.htm

- Follow the instructions of your computer manual and select this graphic for the desktop background (i.e. Start/settings/Control Panel/Disply/Backgrounds) Search for the previous downloaded burst file, using 'Search for'. Select it for a tiled display. Your desktop must now show fine black and white, vertical stripes over the total background.

- Attach now the extender line and mount at the end of the line a **CRT-monitor**. Using a TFT (flatpanel) screen is much more difficult and may also fail: Both - our extender line AND the TFT digitize the video data stream and process the digitized data. If you do this twice, you can't decide by watching your screen, whether the line or the TFT mismatches and needs to be adjusted.

- Pop up the OSD (see page 46 or page 50 (Select parameters of screen position))

- Select menue function 'Automatic detection of the number of pixels per line and the best phase' -  and confirm the process with 

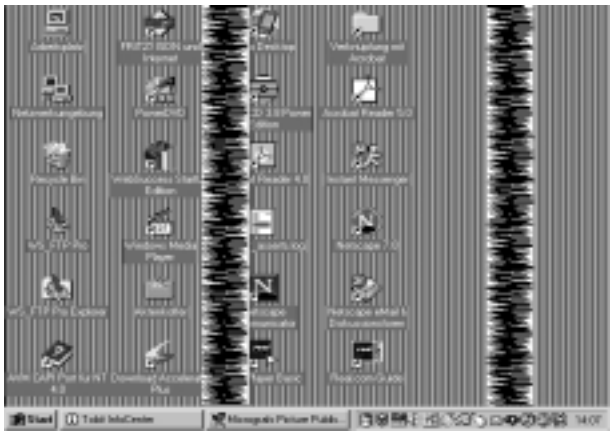


Adjustment is ok

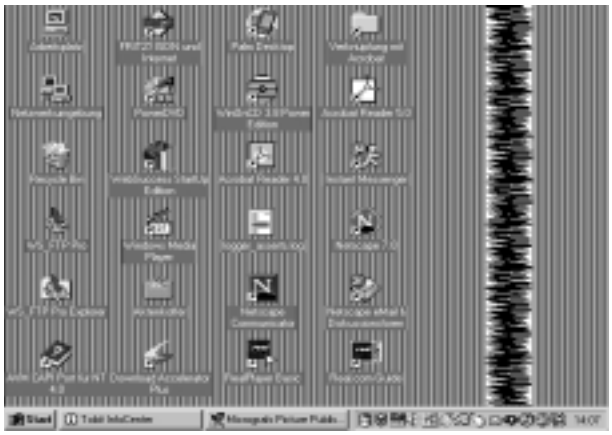
- If you see the vertical, b/w stripes sharp and without jitter or smearing, the adjustment is even done. Now you can attach - if you have - a TFT monitor and do - if necessary - the adjustment of this screen. After all, you can reinstall your preferred desktop background picture.

If you do not see the picture above, after 'Automatic detection...', you need to adjust Pixelclock and Phase manually. Wrong adjusted Pixelclock you detect by one or more, vertical areas, where the lines are smeared. Wrong adjusted Phase you detect by a horizontal noise, horizontal waveformed lines, flicker or smearing with Zebra-pattern.

Please make sure, to adjust the pixelclock first, and afterwards the phase. If there are some parts of the screen heavily smeared or are disturbed by heavy flickering, it might be possible, that the pixelclock is misadjusted unless you do not see any vertical area.



Pixelclock wrong >>



Pixelclock wrong >

- Pop up the OSD (see page 46 or page 50 (Select parameters of screen position))
- Select the menue function ‘manually adjust the number of pixels per line (Pixelclock)’ -  and confirm the process with 
- modify the pixelclock with the arrow-keys  or  until all stripes have disappeared
- Confirm the settings with 

Phase is not ok

- Pop up the OSD (see page 46 or page 50 (Select parameters of screen position))
- Select the menue function ‘manually adjust the best phase (best point for A/D conversion within each pixel)’ -  and confirm the process with 

- modify the phase with the arrow-keys  or  until all distortions have disappeared

- Confirm the settings with 

System update / onboard programming

In some special cases, it might be necessary to update the firmware of the system. Normally this is to be done in the factory. Under some circumstances it might be possible, to do this by the customer. In this case, you will receive from our support a programming cable and software. Please follow the instruction of the program and the shipped brochure.

english

Jumper in Remote Unit (only PS2-devices!)

On the keyboard/mouse daughterboard in the remote unit, there are two jumpers located. With these jumpers, you can modify the behavior of switching between local access and remote access (only devices with PS2-keyboard-modul and local access in the local unit).

Time	2s
	cls
	opn
Mouse	

- The upper switch selects the inactivity timeout period (no keyboard or mouse activity) required before the other user console can gain control. The closed jumper sets to 2 seconds (default), the open one to 15 seconds.

- The lower switch selects the method of switching between local and remote consoles: Pressing any key on the keyboardor pressing the left and right mouse button simultaneously (open = default), or on keyboard activity only.

Supported Video Modes

You will find here a table with the supported video-modes. Our device is able, to synchronize to Video Modes, which do not differ for more than 10% from those, listed below.

Name	Visible Res. Horiz Pixels	Visible Res. Vert Lines	Clock Rates Horiz kHz	Clock Rates Vert Hz	Clock Rates Dot Clk MHz	Framerate Fiber hiCol	Framerate Fiber loCol	Framerate CAT5 hiCol	Framerate CAT5 loCol
DOS graphic Mode	**640**	**350**	31,5	**70**	25	70	70	70	70
Vesa Standard	**640**	**350**	37,8	**85**	31	85	85	85	85
Dos Text Mode	**640**	**400**	24,7	**56**	21	56	56	56	56
Vesa Standard	**640**	**400**	31,4	**70**	25	70	70	70	70
VGA	**640**	**400**	37,8	**85**	31	85	85	43	85
VGA	**640**	**480**	31,5	**60**	25	60	60	60	60
Vesa Standard	**640**	**480**	35,0	**66,7**	31	67	67	67	67
Industry Standard	**640**	**480**	37,8	**72**	31	72	72	36	72
Mac Mode	**640**	**480**	37,5	**75**	32	75	75	38	75
Vesa Standard	**640**	**480**	43,2	**85**	36	85	85	43	85
Vesa Standard	**720**	**400**	31,5	**70**	28	70	70	70	70
Vesa Standard	**720**	**400**	37,8	**85**	35	85	85	43	85
PAL progressive	**720**	**576**	31,2	**50**	27	50	50	50	50
Vesa Guidelines	**800**	**600**	35,1	**56**	36	56	56	28	56
Vesa Guidelines	**800**	**600**	37,8	**60**	40	60	60	30	60
Vesa Standard	**800**	**600**	48,0	**72**	50	36	72	36	36
Vesa Standard	**800**	**600**	46,8	**75**	49	38	75	38	38
Vesa Standard	**800**	**600**	53,6	**85**	56	43	85	43	43
Mac Mode	**832**	**624**	49,7	**75**	56	38	75	38	38
Vesa Guidelines	**1024**	**768**	48,3	**60**	65	30	30	20	30
Vesa Standard	**1024**	**768**	56,4	**70**	75	35	35	23	35
SUN Mode	**1024**	**768**	57,8	**72**	75	36	36	24	36
Vesa Standard	**1024**	**768**	60,0	**75**	79	38	38	25	38
Vesa Standard	**1024**	**768**	68,6	**85**	94	28	43	21	43
DMT1185	**1152**	**864**	63,8	**70**	94	23	35	18	23
Vesa Standard	**1152**	**864**	63,8	**70**	101	23	35	18	23
DMT1185	**1152**	**864**	67,5	**75**	108	25	38	19	25
SUN Mode	**1152**	**900**	61,8	**66**	94	22	33	17	22
Vesa Standard	**1280**	**960**	60,0	**60**	108	20	30	15	20
DMT127A	**1280**	**960**	75,0	**75**	126	25	25	15	25
Vesa Standard	**1280**	**960**	85,9	**85**	148	21	28	17	21
Vesa Standard	**1280**	**1024**	63,9	**60**	108	20	30	15	20
SUN mode	**1280**	**1024**	71,7	**66**	117	22	33	17	22
SXGA	**1280**	**1024**	74,6	**70**	129	23	23	14	23
SXGA	**1280**	**1024**	76,8	**72**	133	24	24	14	24
Vesa Standard	**1280**	**1024**	79,9	**75**	135	25	25	15	25
Vesa Standard	**1280**	**1024**	91,1	**85**	157	21	28	14	21
SGI	**1600**	**1024**	77,6	**72**	158	18	24	12	18
Vesa Standard	**1600**	**1200**	75,0	**60**	162	15	20	10	15

Table with supported screen resolutions and the corresponding refresh rates. The preferred refresh rate for each screen resolution, to get the best frame rate, ist marked especially.

Framerates (FPS - Frames Per Second)

Because the net data rate of a Single Link DVI-Interface with 3,9 Gbit is much higher than the available transfer rate of the link modules, not each picture (Frame) of the Graphic Card is transferred. The transmission follows (simplified) the following scheme:

- Starting with a recognized VS-Signal, the complete following frame is digitized (on VGA) and temporary stored (DVI+VGA)
- The data are transmitted with the available net data rate to the remote unit. Pictures (Frames) which are in the meantime generated by the graphic card are discarded without any recognition (Frame dropping)
- After termination of the data transfer, the system waits for the next VS-Signal

Depending on the data volume (differs by the selected screen resolution / refresh rate), the type of transmission module and the correspondence between the duration of the data transfer and a multiple of the refresh rate, you get frame rates in a renge of app. 15 fps and the actual refresh rate of the graphic card. Please notice: This is **NOT** the actual refresh rate, the monitor at the remote end is driven, this frame rate counts the **number of different pictures**, which may be transferred in one second. The Monitor is always driven with the same refresh rate, the graphic card generates. As the human eye is not able to see more than 15 fps as single pictures but only as a 'movie', our device is also suitable for displaying streaming video in the highest resolution. Naturally in this case it is better, to reduce the screen resolution for the gain of higher frame rates, because video normally does not come in higher resolutions. In higher resolution the mouse pointer may show an effect of moving in a way of broken movement over the screen. But with slower mouse movements, you will always be able to exact positioning with smooth feeling.

Access Switching (only devices with local access)

Using devices with local access, the signals of the connected graphic card is shown on the attached monitors of both, of the local interface and of the remote interface. a 'private'-function is not supported. The connected keyboards and mice can only be used mutual. Since there is a key pressed on one of the keyboards, the pressed key is sent to the PC and this station is active, means, the mouse is driven from this place. The switching can also be done by mouse access. Here you have to press both, the 'LeftMouseButton' and the 'RightMouseButton' simultaneously, this will not be sent to the PC. For switching without any PC-reaction, please use the mouse or a key like Alt, Ctrl or Shift without any additional keystroke.

Addititional, technical information

VGA:Using VGA-signals, the color signals (R, G, B) are analog values in the range of 0...0.8Vpp. The synchronisation signals are TTL-signals with various polarities, depending on the monitor resolution. Due to the design of the units, they do not support “Plug&Play”

DVI: The DVI interface is a digital Video Interface. The Standardization and the supervision of keeping the rules is by the DDWG (Digital Display Working Group s.a. www.ddwg.org). With the Single Link DVI Interface, the three colour channels are transmitted as LVDS-Signals (Low Voltage Differential Signals) with a overall data rate of 1,3 Gbit each. In addition, the clock is transmitted too. With the Single Link DVI, the possible resolutions reach up to 1600x1200@60Hz with a maximum color depth of 24 Bit. With the Dual Link DVI Interface there are three additional color channels with 1,3 Gbit each to be transmitted. Here are screen resolutions of up to 2048x2048 or better color depths possible. This device only supports a Single Link DVI Interface.

PS2-Keyboard:The keyboard interface is a bidirectional, synchronous serial interface . This interface is still the same as the AT-keyboard interface, only the connector is different.

PS2-Mouse: is the same interface like keyboard

SUN Keyboard/Mouse: This interface is a SUN specific interface. For further information, please refer to the manuals of this company

USB: The devices are able to handle USB acoording to the specs of USB 1.0 and USB 1.1. In this moment (and the neares future) USB 2.0 is not supported! But USB 2.0 is bach compatble to USB 1.0/USB 1.1so that you may attach these devices without any problems to your USB 2.0 port. But it will NOT support the USB 2.0 data rates.

Addendum for devices With Audio/Serial Option installed

The Audio/Serial Option consits of daughter boards which allow bi-directional stereo audio and a full-duplex serial data link to be sent across the regular interconnection cable in addition to keyboard, mouse and VGA/DVI video.

- To set up your video, keyboard, mouse follow the instructions in the user guide.
- To set up the extender’s audio and serial link, please follow all of the instructions detailed in this addendum. If you have any questions, contact Technical Support.

serial link:

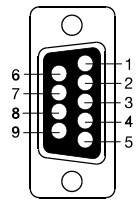
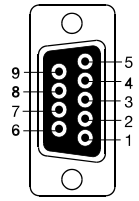
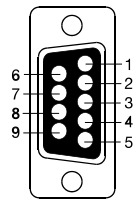
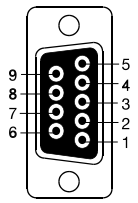
serial speed	:	Any up to a maximum of 19,200 Baud
Serial Data Format	:	Format Independent
Flow Control	:	RTS, CTS, DTR, DSR are sent across link

AUDIO link:

Description	:	Bi-directional stereo audio link
Transmission Method	:	Digitised virtually CD quality audio (16-bit, 38.4KHz)
Signal Levels	:	Line-Level (5 Volts Pk-Pk maximum)
Input Impedence	:	47K
Local Unit Connectors	:	2 x 3.5mm stereo jack socket (Line In & Line Out)
Remote Unit Connectors	:	2 x 3.5mm stereo jack socket (Line/Mic In & Line Out)
Microphone Support	:	A microphone may be connected to the Remote Unit Pullup resistor provides bias for condenser microphone Option to set microphone amplification to +17dB

english

Connectors and cables

 SER IN DB9 female	1- n.c. 2- RxD 3- TxD 4- (DTR) see text 5- GND	6- (DSR) see text 7- (RTS) see text 8- (CTS) see text 9- n.c.	
 SER OUT DB9 male	1- n.c. 2- RxD 3- TxD 4- (DTR) see text 5- GND	6- (DSR) see text 7- (RTS) see text 8- (CTS) see text 9- n.c.	
 to CPU DB9 female	1- n.c. 2- RxD 3- TxD 4- DTR 5- GND	6- DSR 7- RTS 8- CTS 9- n.c.	 to local unit DB9 male

Getting Started

Serial Interface - Set Up and Operation

No setting up or user adjustments are required. Please note that on the dual access model, the serial link is always active

Please bear in mind that the Remote Unit's serial port is wired as DTE (i.e. the same as that on a PC). To connect a serial printer (or other DTE rather than DCE device) to the Remote Unit, you will need a Null-Modem (crossover) cable between the Remote Unit and the printer. Select Xon/Xoff software flow control on the printer and PC. A serial Touchscreen may be plugged directly into the Remote Unit.

Serial Interface – Handling Multiple Serial Devices

The extender's serial interface transmits/receives six signals (3 signals in each direction). Normally four of these signals are used for hardware handshaking (in addition to TX & RX). However, because each handshaking line can support signals up to 19,200 Baud it is possible to configure the serial interface to handle up to three simple 2-wire (Tx/Rx only) serial links. To do this you will need to construct a custom breakout cable. Please contact technical support for further information.

Audio Interface - Set Up and Operation

The audio interface is line-level and is designed to take the output from a sound card (or other line-level) source and be connected to a set of powered speakers at the other end of the link. Stereo audio may be transmitted either way across the link (simultaneously). No set up is required unless a microphone is connected to the remote unit.

Connect up the extender as follows:

- Take the line-level output from your sound card (green connector) and connect to 'Line In' on the extender.
- A set of powered speakers may be connected directly to 'Line Out' at the opposite end of the link.

Audio Interface – Using a Microphone

A microphone may be plugged into the 'Line In' connector on the Remote Unit.

There are two ways of setting up a microphone:

- The Local Unit's 'Line Out' connection should normally be wired to the microphone input (Red) on your sound card. The sound card should then be set up to provide additional amplification (+20dB). This is the preferred connection method.
- Alternatively, the Remote Unit itself can provide microphone amplification. To set this, open up the Remote Unit and locate the jumper labelled 'MIC' on the daughterboard. Connect this jumper across the pins. The Local Unit's 'Line Out' connection should then be wired to 'Line In' (Blue) on your sound card.

If your microphone is already amplified, follow the second method but DO NOT install the amplification jumper in the Remote Unit.

Trouble-Shooting

Error — **possible source of error**

no picture

damage of internal power-supply: Is the LED ‘C’ at the local unit illuminated

- **internal error:** Is at least one of LED’s ‘A’ at the remote unit lightened ?
- **The fiber optical cable is not connected:** at transmitter, at receiver or at bothsides - Is at least one LED ‘B’ at the local unit, the remote unit or at both blinking?
- **The fiber optical cable is wrong adapted:** The strand, connected to the local TX (left-hand connector) must run to the remote RX (right-hand connector) and vice versa.
- **One ore more broken fibers:** ***Do NOT look into a fibers end directly, while it is connected to a local or remote unit! EYE HAZARD MAY OCCURE!*** Is LED ‘C’ at the local unit AND at the receiver unit illuminated? (NOT blinking!). Use a flashlight to check for broken fibers.
- **Did you mount a cable with a wrong fiber type?** If you use your own (not delivered by us) fiber optical cable, please ensure, that you have used 50µ or 62.5µ fiber at a multimode device or a 9µ fiber at a singlemode device. Other fiber-types and poly-fibers are not supported.
- **Do you use a NON VESA resolution on your PC?**: refer to table on page 56 for supported video modes. At the remote unit - is there only one of the two LED’s ‘D’ burning?

horizontal jittering picture **The DPA offset is misaligned:** Refer to page 52 for adjusting the DPA offset

smeared characters **The DPA offset is misaligned:** Refer to page 52 for adjusting the DPA offset

thin vertical lines are missing **The DPA offset is misaligned:** Refer to page 52 for adjusting the DPA offset

coloured areas like ‘oil film’ Under some circumstances, the internal video processor may loose its firmware. In this case it is necessary to reset the total system. A power cycle ist **NOT** sufficient! Please use the OSD to make a ‘factory reset’. Therefor note page 46 - ‘Device Control - OSD (On Screen Display)’ or page - 50 ‘Select the parameters of the OSD, Factory Reset’

Keyboard, mouse without function:

- **no picture:** see above (no picture) for trouble shooting
- **picture ok:** mouse model is not supported

Schedule of parts supplied

All devices come with local interface, remote interface, 2x international power supply unit, PC cable (DVI-I/DVI-I, keyboard/mouse), adaptors: DVI-I/VGA + VGA/DVI-I

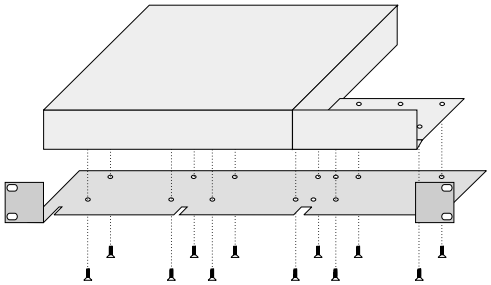
device type	transmission	parts no.
PS2 without local access	Cat5	K439-1S
PS2 without local access	Fiber Multimode	K437-1S
PS2 without local access	Fiber Singlemode	K438-1S
PS2 with local access	Cat5	K439-1W
PS2 with local access	Fiber Multimode	K437-1W
PS2 with local access	Fiber Singlemode	K438-1W
SUN without local access	Fiber Multimode	K440-1S
SUN without local access	Fiber Singlemode	K441-1S
USB without local access	Fiber Multimode	K442-1U
USB with local video access	Fiber Multimode	K442-2U
USB without local access	Fiber Singlemode	K443-1U

Order notation of spare parts/accessories not supplied

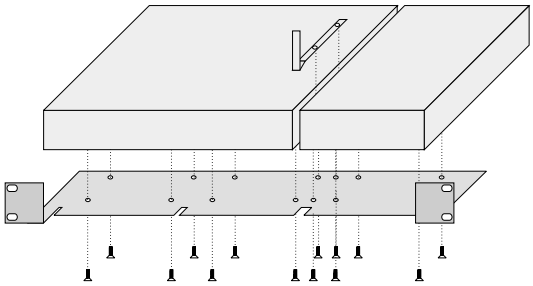
Power supply unit	:	90..240VAC/6VDC, 2000 mA	:	260-4E
Junction cable	:	Cat5 Simplex	:	402-0J
		fiber cable Multimode (Break-Out-cable 2x G50/125µ)	:	433-2M
		fiber cable Singlemode (Break-Out-cable 2x G9/125µ)	:	433-2S
confectioning	:	Cat5 including Cat5 plug/ferrite	:	402-0D
		Multimode including SC plug connectors	:	251-2C
		Singlemode including SC plug connectors	:	251-2S
PC-cable (ZIP-type)	:	DVI-I/PS2; Length = 1,8m (6ft)	:	436-01
(PC to local Interface KVM)		DVI-I/PS2; Length = 3,0m (10ft)	:	436-02
PC-cable		DVI-I, 1,8m	:	436-II
PC-cable		keyboard/mouse SUN, 1,8m	:	416-1J
PC-cable		USB, 1,8m	:	247-U1
Adaptor		VGA/DVI (HD15male/DVI-fem)	:	436-VD
Adaptor		DVI/VGA (DVImale/HD15fem)	:	436-DV
mounting brackets (1 pair)		to mount by screws	:	285-2K
		to mount on profiles	:	286-2K
19”mounting kit		for 1 -3 devices	:	436-1G
19”/1U-housing		for 1-3 devices	:	433-1U
19”/2U-housing		for 1-6 devices	:	433-2U

19”-PCB devices for 19”-housing, please ask your dealer!

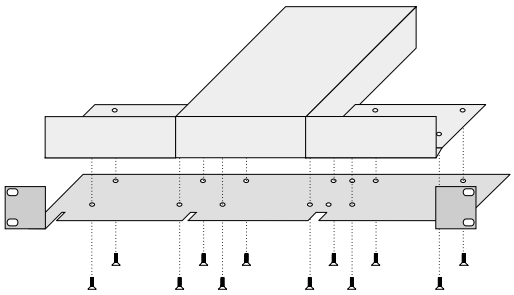
19”-mounting, using 19” mounting kit



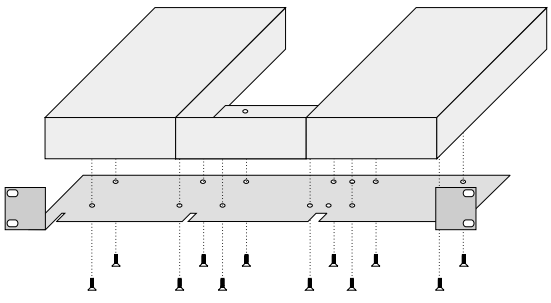
Einbau eines Doppelgehäuses mit 1x Platte groß
mounting of one double space housing, using 1x plate wide



Einbau von 1x Doppelgehäuse und 1x Standardgehäuse mit 1x Streifen schmal
mounting of one double space housing and one regular housing, using 1x stripe narrow



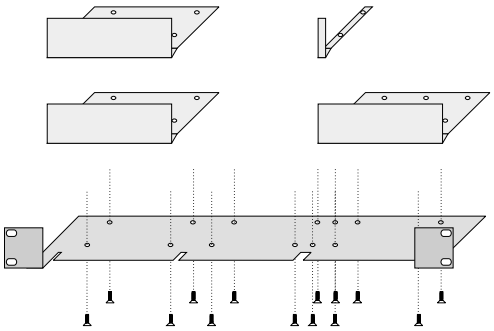
Einbau eines Standardgehäuses mit 2x Platte klein
mounting of one regular housing, using 2x plate small



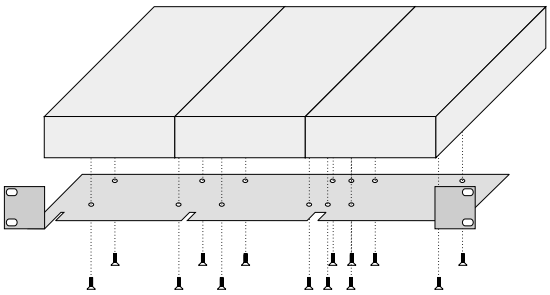
Einbau von 2x Standardgehäuse mit 1x Platte klein
mounting of two regular housings, using 1x plate small

Montageanleitung DDXi-19”-Einbausatz /
Mounting instruction DDXi-19”-Rackmount Kit

Lieferumfang /
List of parts delivered



1x Grundträger / base plate
2x Platte klein / plate small
1x Platte groß / plate wide
1x Streifen schmal / stripe narrow
14x Kreuzschlitzschraube M4x10 /
Philips type screw M4x10



Einbau von 3x Standardgehäuse ohne Platten
mounting of three regular housings, using no additional plates

english

CE-declaration of conformity

This is to certify that, when installed and used according to the instructions in this manual together with the specified cables and the maximum cable length <3m, the Units are shielded against the generation of radio interferences in accordance with the application of Council Directive 89/336/EEC as well as these standards:

EN 55022: Fiber+STP		1999	class	B
EN 55022: UTP		1999	class	A
EN 55024:		1999		
IEC 61000-4-2:	2001			
IEC 61000-4-3:	2001			
IEC 61000-4-4:	2001			
IEC 61000-4-5:	2001	(Cat5 device only)		
EN 61000-3-2		2001		
EN 61000-3-3		2002		

The device was tested in a typical configuration with PC.

Oberteuringen, Monday, 14th April, 2003

The management

Disclaimer

While every precaution has been taken in the preparation of this manual, the manufactorer assumes no resposibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, or circuitry of the product without notice.

The manufacturer cannot accept liability for damage due to misuse of the product or due to other circumstances outside the manufacturer’s control. And the manufacturer will not be responsible for any loss, damage, or injury arising directly or indirectly from the use of this product.