



Queensland University of Technology

# Audiovisual Installation Standards and Guidelines

*Commercial in Confidence*

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## Revision History

<b>Version</b>	<b>Detail</b>	<b>Date</b>	<b>By</b>
0.1	First draft (not for distribution)	27/2/05	PD
0.2	Added checklist table (Appendix B)	9/3/05	PD
0.3	Added Wiring drawings	23/3/05	JV
1.0	Incorporated comments by AV Projects	4/4/05	PD
1.1	Added network setup procedures for PJs	4/4/05	PD
1.2	Definitions added	5/4/05	PD
1.3	Confidentiality notice added	5/4/05	PD
1.4	Added remote mice to PC install (section 1.4). Also – in-ceiling cables (section 2.3)	11/4/05	PD
1.5	Added AMX Quick Start Guides	11/4/05	PD
1.6	Roles & Responsibilities Table added	9/5/05	PD
1.7	Netlinx security password changes added	11/5/05	PD
1.8	AMX device naming convention changed	17/10/05	PD
	DMC805 lighting controller added	17/10/05	PD
1.9	AMX system numbering scheme modified to cope with 2 masters in a room (eg master-slave systems using 2 NI-3000s)	18/10/05	PD
2.0	AMX device numbering standardised to AMX defaults. Added new network subnet configuration	11/9/06	PD
2.1	Changed PJ models added cable specs updates to building no's & device no's	19/6/07	JV
2.2	Changed AV Projects to Learning Environments Projects. Updated PJ IP setup	17/7/08	JV
2.3	Changed to NI-2100 & NI-3100, added CV5 & removed MVP8400	17/7/08	JV
2.4	Updated Room Classifications	22/1/09	JV
2.5	Added Flat panel display specifications	13/3/09	JV
2.6	Updated details for 2011	10/2/11	JV
2.7	Updated details for 2012	19/9/12	JV

### **Definitions**

**QUT** – means QUT's Learning Environments AV Projects group.

**Contractor** – means any person or company commissioned by QUT to perform work on QUT's audiovisual systems other than QUT AV projects staff.

# Section 1. QUT Equipment Standards

## 1.1 Projectors

Standard classrooms & small theatres – **Panasonic PT-EZ570**

Typical lecture theatre – **Panasonic PT-EZ570**

Large lecture theatre – **Sony VPL-FH500**

Very large lecture theatre – **Sanyo PLC-XF47**

Special applications – **Sony VPL-CW125** (only with approval)

See Section 6 for network setup procedures for projectors.

Outside contractors shall clearly state whether network configuration is included or excluded in their scope of works.

## 1.2 Flat Panel Displays

In some installations, flat panel displays will be used as an alternative to projectors.

At the time of writing, the QUT recommended models are:

- **LG42LW5700** for classrooms and small, simple systems
- **LG 55LV355H** as above, but in larger spaces

Because models change frequently, please contact QUT prior to quoting/installing to confirm current models.

## 1.3 Control System

AMX Netlinx exclusively.

- **NI-700** for classrooms and small, simple systems
- **DVX-2150HD** for typical PBL rooms & small theatres
- **DVX-3150HD** for larger theatres.
- For Master-Slave applications, two AMX controllers shall be connected via Ethernet.

Touchpanels shall be **TPI-PRO2-DVI** or **TPI-PRO4-DVI** with **19" wide screen Intellitouch serial monitors**.

The use of wireless touchpanels within QUT is not recommended, because of network security issues.

The control panel for small meeting rooms or classrooms shall be: **AMX NXD-700Vi** touchpanels or AMX **Novara SP-08-AX-US** button panels.

The control panel for MoCows and WallCows shall be:

**AMX CP-3006**

#### **1.4 Document Camera**

**Lumens DC158** wired for XGA output and connected via USB to the presentation PC.

#### **1.5 PC**

As PC models change frequently, please liaise with QUT Learning Environments for the current model specifications.

All PC software will be by QUT.

#### **1.6 DVD Player**

Separate DVD players are no longer fitted to most QUT spaces, as every installed PC has a DVD drive built-in.

#### **1.7 Audio system**

**AMX DVX-2150HD or DVX-3150HD** presentation switchers shall control the audio in smaller spaces like PBL rooms. In larger spaces such as stepped floor lecture theatres, separate audio DSP shall be used, QUT recommends the **Biamp Nexia or Audia DSP** units.

QUT recommends the **AKG DSR 700** digital radio mic system in all lecture theatres. For PBL spaces, the **Revolabs Solo HD** digital system is to be used.

Speakers shall typically be **Bose DS16F** flush ceiling speakers arranged for even coverage.

Other speaker types are in use across QUT, the actual type/model to be used in any given situation shall be determined in consultation with QUT Learning Environments AV Projects.

Radio mic channels will be assigned by with QUT Learning Environments AV Projects.

#### **1.8 Hearing augmentation system**

Each new space that has sound re-enforcement shall have an IR hearing assistance system fitted.

QUT recommend the **Williams Sound WIR TX925** for large rooms (seating capacity of 60 plus) and the **WIR TX75** for smaller rooms (seating capacity of less than 60).

### **1.9 Power switching**

Power switching shall be via **AMX-PC2** modules in small (AV4 & PBL) systems and by **AMX-PDU** units in stepped lecture theatres.

### **1.10 Lighting**

Light dimmers shall be **Dimtek DLE405** or **DLE410** or similar suitable **Dimtek units**. Other brands are not acceptable.

Light switching shall be via Dimtek **DDRC320FRMOT** or similar suitable Dimtek electronic contactors connected to the same Dy-net bus as dimmers.

Lighting control shall be via a door entry/exit switch, located adjacent to the entry doors. If the space has multiple entry doors, there is to be a panel per door. This switch is to be a 2 button **Dynalite DPN821** or similar, connected to the same Dy-net bus as dimmers.

Movement sensors are to be fitted to cover the entire space and shall be **Dynalite DUS804C** or similar, connected to the same Dy-net bus as dimmers.

Because lighting control technology is changing rapidly, please consult QUT LE Projects when specifying lighting controls and movement sensors.

See also Section 5 (Lighting)

### **1.11 Slide Projectors**

No longer fitted in theatre

### **1.12 Overhead projectors**

**3M 1810**. Use of OHPs is declining but they are still required.

### **1.13 VHS playback**

VHS playback equipment will no longer be fitted

### **1.14 Room Classification Scheme**

Please note that the QUT room classification scheme is currently undergoing a major review in light of recent developments in technology and pedagogy.

Please refer to the chart below during this review period

Room equipment levels are classified as follows:

AV0 – No AV facilities

- AV2M – Large flat panel display wall mounted with wall mounted small PC(MELT image)
- AV2S - Large flat panel display wall mounted with wall mounted small PC(staff image)
- AV3 – Data projector installed to AV4 standard, connection panel and network connection
- AV4 – AV3 plus PC, Video connection plate, Laptop connection, simple AMX system
- 2 PJ AV4 - AV4 standard installation, but with dual data projectors displaying the same image
- AV4P – AV4 standard installation, but with flat panel/s instead of data projector
- AV5 – Fully equipped theatre (incl. document camera, touchscreen AMX control)
- AV5P – AV5 standard installation, but with flat panel/s instead of data projector
- AV6 – Multi-projector projector theatre
- AV7 – Multi-projector, surround sound (fully equipped).

## Audiovisual Facilities in Centrally Timetabled Spaces

Equipment Type	AV Level										
	0	2 M	2 S	3	4	2 PJ AV4	4P	5	5 P	6	7
Projection Screen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	◆	<input type="checkbox"/>	<input type="checkbox"/>	◆	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple projection screens		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	<input type="checkbox"/>		<input type="checkbox"/>	◆	◆
Data projector		<input type="checkbox"/>	<input type="checkbox"/>	◆	◆	<input type="checkbox"/>	<input type="checkbox"/>	◆	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple data projectors		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	◆
Flat panel displays		◆	◆				◆		◆		
OHP		◆									
DVD Playback		<input type="checkbox"/>	◆	◆	◆	◆	◆	◆	◆	◆	◆
Installed computer		◆	◆		◆	◆	◆	◆	◆	◆	◆
Laptop connection		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Document Camera		<input type="checkbox"/>	◆	◆	◆	◆					
Network connection		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Telephone		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Voice Reinforcement (PA System)		<input type="checkbox"/>	◆	◆	◆	◆					
Stereo program audio system		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	◆	◆	◆	◆	◆	◆
Radio microphone system		<input type="checkbox"/>	◆	◆	◆	◆					
Fixed AV equipment bench		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	◆	◆	◆	◆	◆	◆	◆
Lighting controls at bench		<input type="checkbox"/>	◆	◆	◆	◆					
Biobox (control room)		<input type="checkbox"/>	◆	◆							
Simple AMX control system		<input type="checkbox"/>	<input type="checkbox"/>		◆	◆	◆	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comprehensive control system		<input type="checkbox"/>	◆	◆	◆	◆					

## Section 2. Equipment installation practice

### 2.1 Projectors

Projectors will be mounted on a security bracket supplied by or approved by QUT . The QUT standard bracket is the **Kencourt QUT Style Bracket**, supplied by Kencourt P/L, details available from QUT.

No projector will be installed in a location where it cannot be serviced from a 2.4 metre step ladder. Otherwise the projector shall be installed in a secure mounting in the bio-box or rear of theatre.

Access to air filters and lamp must be provided without removing the projector from its mount.

Network-capable projectors will be connected to the QUT network. See Section 6 and Appendix B for network setup information. Contractors shall clearly state whether network configuration is included or excluded in their scope of works. QUT standard padlocks shall be fitted to the cage and to lock the telescopic section of the mounting column. Padlocks will be supplied by QUT.

### 2.2 Racks

Racks will be industry standard 19” racks sized to suit the installation. Racks will typically have removable side panels and a lockable rear keyed to **QUT’s common rack key. Locks will be supplied by QUT.**

Equipment shall be mounted via **M5 cage nuts**. Screws shall be **M5 Stainless Steel Philips cheese-head or round-head**.

Each item of equipment (except blank panels) shall have one **M5 Stainless Post-butt round-head tamperproof** screw in the upper right-hand corner.

Each item of equipment shall have 4 mounting screws fitted.

PCs shall have 4 tamperproof screws (specified above) independent of rack slides. There shall be no weight or shear stress on the tamperproof screws. Where necessary, rack flanges of the PC will be drilled to accept the tamperproof screws in the correct position. Drilling and tapping the rack is not acceptable.

### 2.3 Cabling

All cabling shall be neat and secure.

Where equipment is mounted on slides, sufficient cable length shall be provided to enable the item to be withdrawn to the limit of the slides while remaining fully operational and without stress on cables or connectors.

**Any in-ceiling, cabling shall be suspended above ceiling tiles on catenaries or cable tray.**

At least one spare UTP cable shall be run from the AV bench to the ceiling space for use as a draw cable and/or future use.

Cables terminating at the equipment racks or lecterns shall have 4m tails provided. Cables terminating at the equipment, ie. Data projectors, speakers etc. shall have 2m tails provided.

## **2.4 Cable labelling**

All cables shall be labelled within 25mm of the connector with a permanent label indicating where it is/should be connected & the signal source.

Eg. PC VGA input A of a projector should be labelled 'InputA- PC'. Output 3 of VDA2 should be labelled 'VDA2 Out 3'

If using 'Cable Label' adhesive labels, text should be kept to a minimum and font size kept large.

Masking tape or insulation tape must not be used for labels.

P-Touch labels are prone to falling off and must not be used unless secured by additional means (eg heatshrink).

## **2.5 Cable specifications**

The cable types specified below are the only cable types permitted by QUT, any variations to this must have written authorisation from QUT.

**Microphone cable** – Canare “Star Quad” cable

**Video cable** – Belden 8241 RG-59/U Co-axial cable

**Balanced audio cable** – Hartland HC4076 2 core shielded cable

**Unbalanced audio cable** – RS 367-599 Fig.8 twin screened cable

**CAT6 cable** – Belden, Molex or equivalent

**CAT6A (shielded) cable** – Belden, Molex or equivalent

**Speaker cable** – long runs: 4mm<sup>2</sup>, 2 core, multi-stranded, double insulated  
- short runs: 1.5mm<sup>2</sup>, 2 core, multi-stranded, double insulated

**VGA cable** – Pre-made VGA cables with moulded connectors and ferrite chokes, normally supplied by QUT– contractor to supply QUT with length requirements.

**Fibre Optic cable** – Belden

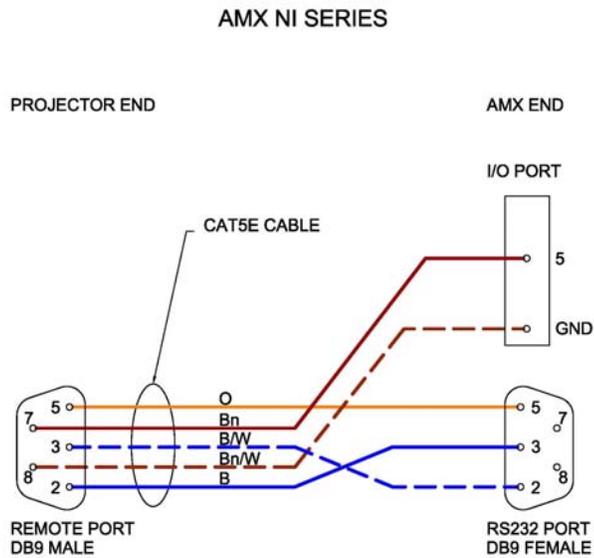
**DVI** – Lindy or equivalent

**HDMI** – Lindy or equivalent

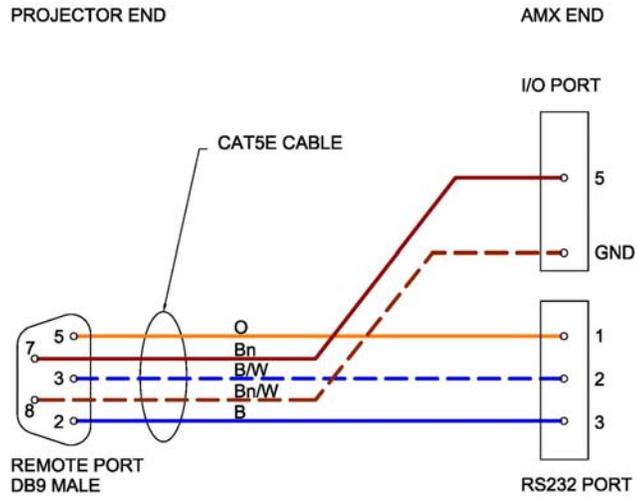
## 2.6 Wiring Conventions

### Projector

Projector RS232 shall be wired as follows:

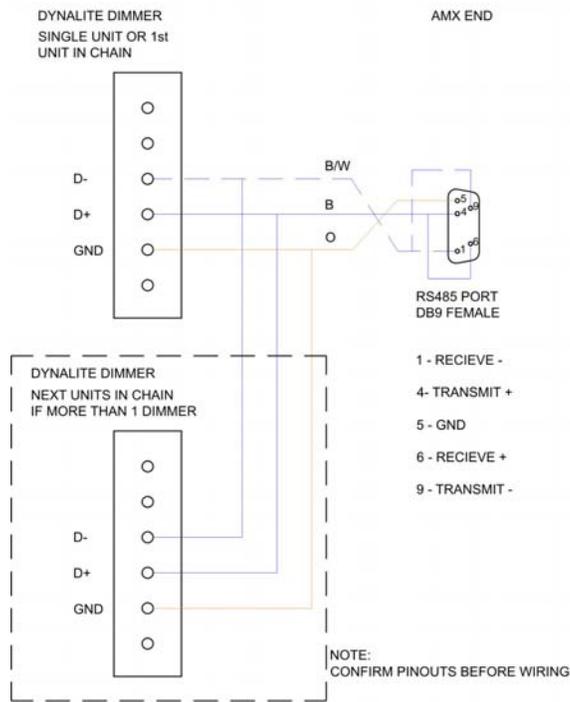


## AMX NXI SERIES

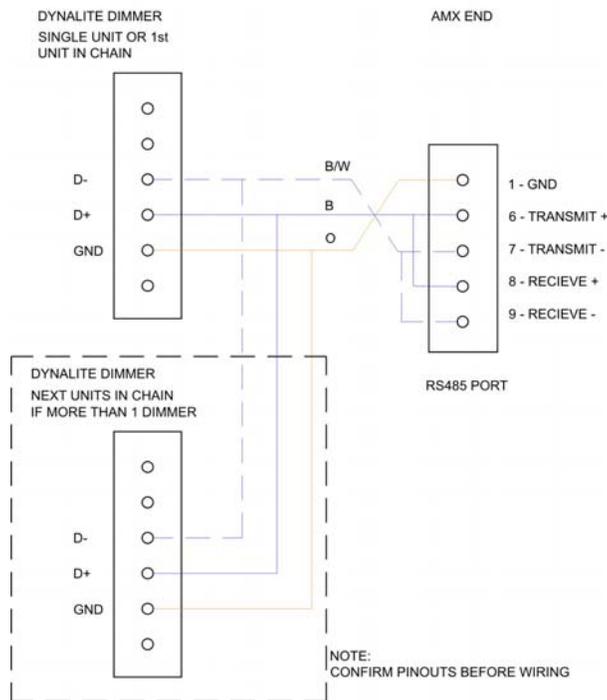


# Dimmer

## AMX NI SERIES

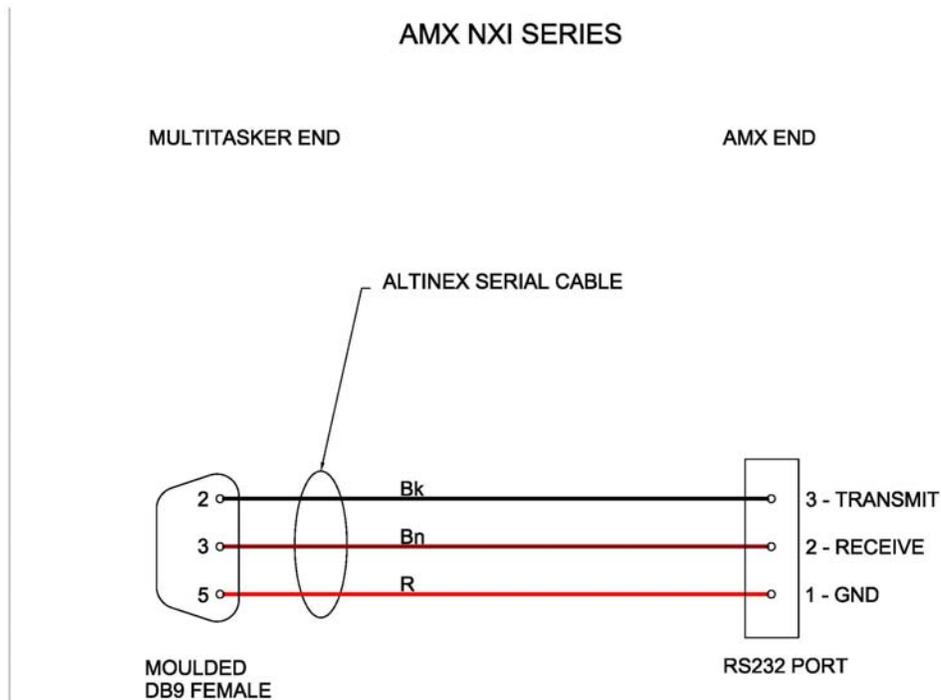
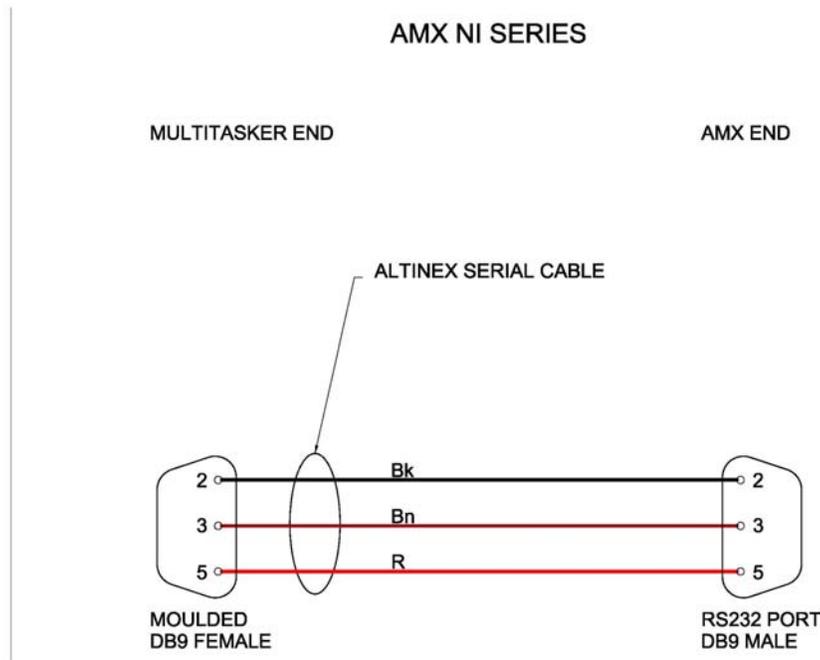


## AMX NXI SERIES



## Multi-Tasker

Use the supplied RS232 cable and cut off one end.

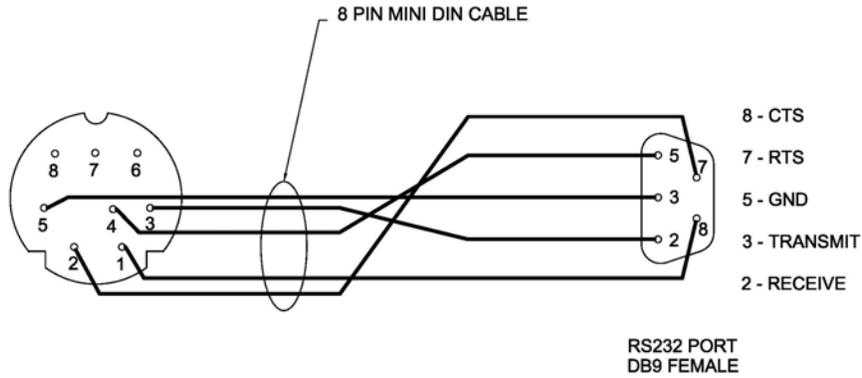


# RE-450X Document Camera

## AMX NI SERIES

RE 450 END

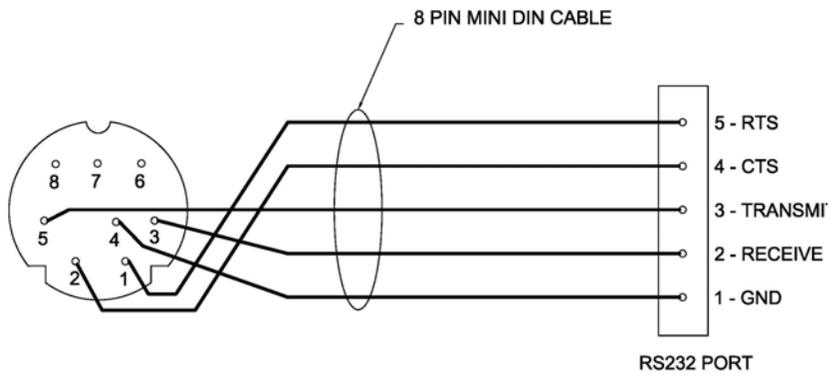
AMX END



## AMX NXI SERIES

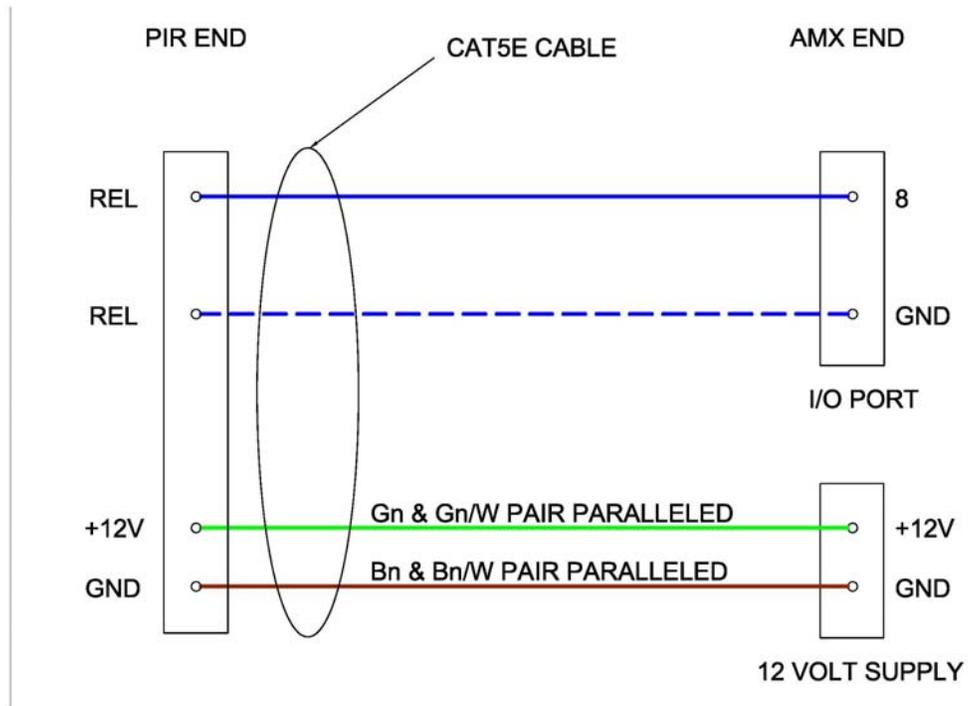
RE 450 END

AMX END

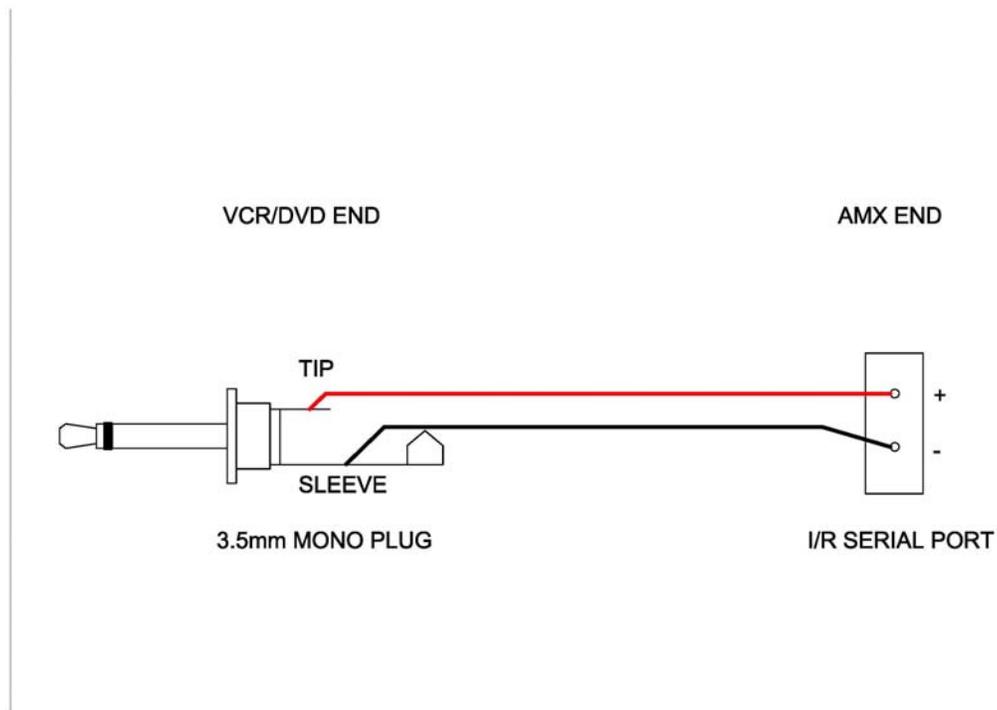




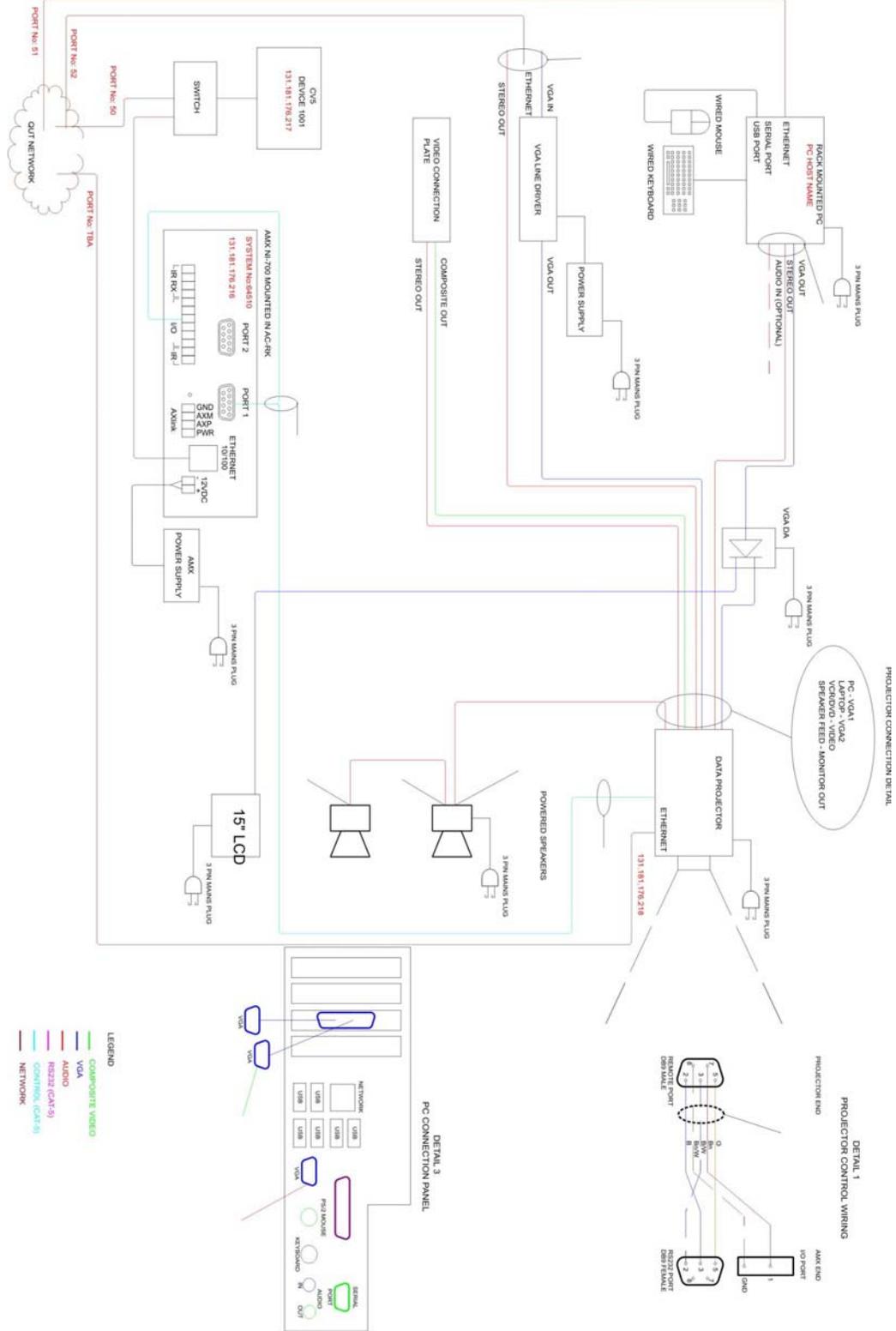
### PIR Motion Detector



### Wired I/R Serial – VCR/DVD Control



# Typical Classroom System



## Section 3 – AMX Configuration

### **3.1 AMX Device Numbering**

0 – Master

1-255 for any AXLink devices

128 – Main G3 touchpanel

129 – 2<sup>nd</sup> device of above

130 – 3<sup>rd</sup> device of above

131 – 4<sup>th</sup> device of above

132 – Secondary touchpanel

133 – 2<sup>nd</sup> device of above

136 – Extra control panel

141 – Button panel 1

142 – Button panel 2

143 –

144 –

145 –

146 – Button panel 6

601 - TPI4 using ICSNet connection (Ethernet connection preferred)

5001 - Netlinx master

5002 - Netlinx slave

10001 - Touchpanel using Ethernet connection

11001 – MVP wireless touchpanel

7000 – i!PCLink connection to PC applications

7001 – PC audio recorder

7002 – PC display control (used to switch between single VGA & dual VGA outputs)

7003 – PC link to control system power (AV4 rooms)

30000 – html web control

30001 – 2<sup>nd</sup> device of above

35001 – virtual touchpanel

33001 – RMS Engine (MeetingManager)

33002 – ConnectLinx Engine

## 3.2 QUT's AMX System Numbering Scheme

Valid AMX system numbers are 1 to 65536.

Each Netlinx master connected to the QUT network must have a unique system number.

QUT has devised a scheme based loosely on campus, building and room meets this need.

*(QUT room numbering structure is typically CC-Bnnn where CC is the alphabetic campus code, B is the building name and nnn is the room number. Eg GP-H405 is at Gardens Point campus, H Block, level 4 room 405.)*

QUT's active Netlinx masters start at system 1,000.

The scheme uses the thousands part to identify campus and building (see table). Eg a system 8,405 is in GP-H Block.

GP campus building are numbered 1000 to 26999, KG 27000 to 52999, CA (Carseldine) 53000 to 59999 and CB (Caboolture) 60000-63999. 64000 and 65000 series are reserved.

The 3 least significant digits identify the room number within the building – ie 8,405 is room 405 in GP-H Block or GP-H405.

*Some liberties and adjustments are required to cope with room numbering anomalies – eg GP-Z1124 on the 11<sup>th</sup> floor can't be called 261124 (exceeds the 65536 limit), so is called 26124. This works because there is no room Z124. QUT will assign non-standard numbers to avoid potential conflicts.*

*An added complication has arisen with the adoption of master-slave Ethernet connections – there will be two systems in one room, but they need unique system number. The typical scheme is:*

*Add 70 to the system number for the 'slave' processor. Examples:*

- *In KG-W201, the master is 49201 & the slave is 49271*
- *In GP-Z411, the master is 26411 & the slave is 26481*

*This scheme will produce unique numbers in 99% of cases – but still requires some care to avoid any duplicates.*

## Building numbering scheme table.

(,000)

Building	Code	Building	Code	Building	Code	Building	Code
GP-A	1	KG-A	27	KG-SYN	53	CB-A	60
GP-B	2	KG-B	28			CB-B	61
GP-C	3	KG-C	29			CB-C	62
GP-D	4	KG-D	30			CB-E	63
GP-E	5	KG-E	31			CB-K	64
GP-F	6	KG-F	32			CB-J	65
GP-G	7	KG-G	33				
GP-H	8	KG-H	34				
GP-I	9	KG-HC	36			Canberra	500
GP-J	10	KG-K	37				
GP-K	11	KG-L	38			MERF	65500
GP-L	12	KG-M	39				
GP-M	13	KG-N	40				
GP-N	14	KG-O	41				
GP-O	15	KG-P	42				
GP-P	16	KG-Q	43				
GP-Q	17	KG-R	44				
GP-R	18	KG-S	45				
GP-S	19	KG-T	46				
GP-T	20	KG-U	47				
GP-U	21	KG-V	48				
GP-V	22	KG-W	49				
GP-W	23	KG-X	50				
GP-X	24	KG-Y	51				
GP-Y	25	KG-Z	52				
GP-Z	26						

### Known anomalies

- KG-O block has 4 wings called OA, OB, OC & OD. Some creativity is required to create unique system numbers but fortunately has few Netlinx systems on the network.
- KG Creative Industries Precinct uses Z1, Z2, Z3, Z4, Z5 & Z6 for it's six buildings. Careful planning will be required to avoid conflict.
- Some rooms are split & use suffix A and B – eg there are 2 adjacent rooms CA-R203A and CA-R203B. Workaround is to call them 59203 and 59204 which works because CA-R204 is unlikely to have a Netlinx master.

### Examples

17224 = GP-Q224

42309 = KG-P309

### **3.3 AMX Ports**

#### **3.3.1 IP ports**

- 0:1:0 - System
  
- 0:3:0 - RMS Engine (MeetingManager)
- 0:5:0 - G4 Computer Control
- 0:6:0 - Projector1 IP control
- 0:7:0 - Projector 2 IP control
- 0:8:0 - Projector 3 IP control
  
- 0:10:0 - Email engine (i!EquipmentMonitor)

#### **3.3.2 NXI ports (typical)**

- 1 Projector
- 2 Doc camera
- 3 Slide projector (if fitted)
- 4 Multi-tasker cardframe
- 5 Mixer/amp or audio DSP
- 6 Dimmer
- 7 Relays – see below for relay channels
- 8 IR for DVD player
- 9 Not used
- 10 Not used
- 11 Not used
- 12 Not used
- 13 Not used
- 14 Not used
- 15 Not used
- 16 Sense inputs

#### ***NXI relay channels***

- 1 Bench power
- 2 Biobox rack power
- 3 FOH Fluoros
- 4 ROH Fluoros
- 5 Board lights
- 6 Aisle lights
- 7 Spotlights
- 8 Lecture in Progress lights
- 9 Spare
- 10 Spare
- 11 PC Reboot
- 12 Alarm

### ***I/O channels***

- 1 Door plate – ON
- 2 Door plate – OFF
- 3
- 4
- 5 Projector sense
- 6 Projector 2 sense
- 7
- 8 PIR

### **3.3.3 NI-3000 ports (typical)**

- 1 Projector
- 2 Doc camera
- 3 Slide projector (if fitted)
- 4 Multi-tasker cardframe
- 5 Mixer/amp or audio DSP
- 6 Dimmer
- 7 Not used
- 8 Relays (see below)
- 9 IR for DVD player
- 10 Not used
- 11 Not used
- 12 Not used
- 13 Not used
- 14 Not used
- 15 Not used
- 16 Not used
- 17 Sense inputs

### ***NI-3000 Relay channels***

- 1 Bench power
- 2 Rack power
- 3
- 4
- 5
- 6
- 7 PC Reboot
- 8 Alarm

### ***NI-3000 I/O Channels*** (As per NXI)

## **AMX Security Configuration**

All security configuration will be done by QUT LE Projects staff.

Two standards user accounts will be created:

- A 'workshop' account for technical staff.
- A campus-specific account with restricted access

Default 'Nelinx' account will be deleted.

Default 'administrator' password will be changed to the master QUT password.

Other accounts can be created on request – eg for access by faculty technical staff.

Any security changes from AMX factory standard by contractors is strictly forbidden. If access is blocked to any function in the system by any contractor-applied security setting, payment will be withheld until factory settings are restored.

### **IMPORTANT**

**Security settings by QUT LE Projects only.**

### 3.4 AMX Device Naming Conventions

(Added 17/10/05)

QUT will adopt AMX's preferred device naming conventions for future systems. Devices will be prefixed with 'dv' and virtual devices prefixed with 'vdv'. Standard device names are:

dvPJ	- Projector (for single-projector systems)
dvPJ1	- Projector (for multi-projector systems)
dvPJ2 etc	
dvDOC	- Document camera
dvMultiTasker	- MultiTasker cardframe
dvAMP	- Digital mixer/amp or audio DSP
dvDIMMER	- Dimmer
dvRELAY	- Relay ports
dvDVD	- DVD player or combo
dvTV	- TV tuner (eg set-top box)
dvSENSE	- I/O ports
dvTP	- Main touchpanel (simple system)
dvTPb	- 2 <sup>nd</sup> device/port of main touchpanel
dvTPc etc	
dvTP2	- 2 <sup>nd</sup> touchpanel
dvPC	- PCLink connection to PC
dvRECORDER	- Audio Recorder software on PC
dvWEB	- HTML pages
vdvTP	- Virtual device for main touchpanel
vdvTPb etc	- extra ports on main touchpanel
vdvTP2	- Virtual device for 2 <sup>nd</sup> touchpanel

### 3.5 TPI-PRO2 & TPI-PRO4 Configuration

TPI-PRO2 & PRO4 will communicate with the master via Ethernet.

Standard hardware setup for the TPI-PRO2 is:

- Slot 1 – RGB card
- Slot 2 – Video card
- Slot 3 - empty
- Slot 4 – empty

For AV6 or AV7 theatres (multi-projector) TPI-PRO4 is:

- Slot 1 – RGB card
- Slot 2 – RGB card
- Slot 3 - Video card
- Slot 4 – Video card

Touchpanel monitors will be either:

- Elo Intellitouch 15” model LCD1525L-IT. Touch type is **EloTouch**
- Elo Intellitouch 19” model LCD1925L-IT. Touch type is **Elo19Touch**
- Elo Intellitouch 19” Widescreen model 1900L. Touch type is **Elo19Touch**

Mouse output from touchpanel monitor is serial.

Audio will be connected from the TPI4’s audio output to the Elo monitor.

TPI-PRO settings:

- **Ethernet** system connection
- Device **10001**
- **Static IP** address assigned by QUT (not DHCP)
- Subnet mask usually **255.255.255.0, but not always. Confirm in IP Address list**
- Gateway address assigned by QUT
- Hostname assigned by QUT in the form tpi4-cc-rrrr where ‘cc’ is the campus code and ‘rrrr’ is the room name. Eg tpi4-ca-c321. Must be lower case.
- Enter Netlinx master’s IP address & system number in the ‘Master’ section.
- Enable G4 Web Control & enter a suitable description eg CA-C321 Control Screens
- Set resolution to match the monitor – eg 1024x768 for 15”, 1280x1024 for 19”
- Set touch type to match monitor. **NB – Elo 19” is different to 15”.**

### 3.7 AMX Button Panels

Device number for any button panels start at 141 and increment is more than one panel per system.

#### Procedure

1. Set dipswitch to device number
2. Cycle power to register new setting.

#### Device 141 dipswitch

1	2	3	4	5	6	7	8
	X			X	X	X	
X		X	X				X

#### Device 142

1	2	3	4	5	6	7	8
X				X	X	X	
	X	X	X				X

#### Device 143

1	2	3	4	5	6	7	8
				X	X	X	
X	X	X	X				X

#### Device 144

1	2	3	4	5	6	7	8
X	X	X	X		X	X	
				X			X

#### Device 145

1	2	3	4	5	6	7	8
	X	X	X		X	X	
X				X			X

#### Device 146

1	2	3	4	5	6	7	8
X		X	X		X	X	
	X			X			X

## Section 4. Lighting

All lighting dimmers shall be Dynalite brand and shall communicate via Dy-Net RS485 protocol.

Typical theatre lighting control shall consist of a DLE-405 4-channel dimmer for downlights (configured as channels 1 to 4) and a DDRC320FR-MOT 3-channel contactor for switched circuits. (configured channels 5 to 7)

Typical channel allocation shall be:

- Channel 1 - Front zone of downlights
- Channel 2 - Centre zone
- Channel 3 – Rear zone
- Channel 4 – Reading lights over bench
- Channel 5 – Front house lights
- Channel 6 – Rear house lights
- Channel 7 - Board lights

Alternatively, a DMC805 may be used if HF fluoro dimming is installed. This unit provided 4 channels of dimming (channels 1-4), 4 channels of switching (5-8) and 4 channels of DSI or 0-10V DC for HF ballast controllers. Channel allocation shall be as follows (typically):

- Channel 1 –
- Channel 2 –
- Channel 3 – Aisle lights
- Channel 4 – Reading lights
- Channel 5 – switch mains to FOH fluoro zone
- Channel 6 – switch mains to ROH fluoro zone
- Channel 7 – board lights
- Channel 8 – lecture in progress light
- Channel 9 – DSI to FOH zone of HF ballasts
- Channel 10 – DSI to ROH zone of HF ballasts
- Channel 11 –
- Channel 12 -

## AMX Configuration Form

**Project:**.....

<u>Item</u>	<u>Setting</u>	<u>Comments</u>
<b>Master type</b>		
- Device number	5001	
- System number		
- Hostname	netlinux- -	Must be lower case
- IP address	131.181. .	
- Subnet mask	255.255.255.	
- Gateway address	131.181. .	
- Domain suffix	avs.dis.qut.edu.au	Must be lower case
- DNS 1	131.181.59.48	KG
- DNS2	131.181.127.32	GP
- URL List	131.181.140.1	
- Date & time	Local time	
<b>G4 Touchpanel type</b>	TPI-PRO2 or PRO4/Other	
- Device number	10001	
- Connection type	Ethernet	
- Hostname	tpi- -	Must be lower case
- IP address	131.181. .	
- Subnet mask	255.255.255.	
- Gateway address	131.181. .	
- Master IP address	(as set in master above)	
- System number	(as set in master above)	
- G4 Web Control	Enabled	
- G4 Web Name	- -Control	
- Password	1988	QUT will set
<b>TPI-PRO2 setup</b>		
- Touch type	Elo/Elo 19	15" & 19" use different drivers
- Slot 1	RGB card	
- Slot 2	Video card	
- Slot 3		
- Slot 4		
<b>TPI-PRO4 setup</b>		
- Touch type	Elo/Elo 19	15" & 19" use different drivers
- Slot 1	RGB card	
- Slot 2	RGB card	
- Slot 3	Video card	
- Slot 4	Video card	



For more detailed installation, configuration, programming, file transfer, and operating instructions, refer to the *NetLinX Integrated Controllers Instruction Manual*, available on-line at [www.amx.com](http://www.amx.com).



FIG. 1 NI-700 NetLinX Integrated Controller (front and rear views)

**Overview**

The NI-700 unit (FG2105-03) is geared to meet the specific control and automation needs of a single room environment, where both price and functionality are the driving requirement. This product is configured to control a limited number of video players, projectors, lighting, thermostats, and other electronic equipment. The NI-700 provides support for 1 IR/Serial Output port, 2 RS-232/RS-422/RS-485 ports, 4 Digital Input/Output ports, and 1 IR RX port.

**Note:** The NI series of NetLinX masters does not support controlling RS232 devices via the IR port.

**ATTENTION!**

When working with the NI-700 Integrated Controller, verify you are using the latest version of NetLinX Studio (available for download from [www.amx.com](http://www.amx.com)).

NI-700 Specifications	
<b>Dimensions (HWD):</b>	<ul style="list-style-type: none"> <li>1.58" x 5.54" x 5.12" (4.01 cm x 14.10 cm x 13.00 cm)</li> <li>1 rack unit high</li> </ul>
<b>Power:</b>	<ul style="list-style-type: none"> <li>280 mA @ 12 VDC</li> </ul>
<b>Memory:</b>	<ul style="list-style-type: none"> <li>32 MB SDRAM</li> <li>16 MB Flash chip</li> <li>512 Kb of Non-volatile SRAM</li> <li>Refer to the <i>NetLinX Integrated Controllers Instruction Manual</i> for more information.</li> </ul>
<b>Microprocessor:</b>	<ul style="list-style-type: none"> <li>304 MIPS using a PowerPC™ processor</li> </ul>
<b>Weight:</b>	<ul style="list-style-type: none"> <li>1.30 lbs (0.59 kg)</li> </ul>
<b>Enclosure:</b>	<ul style="list-style-type: none"> <li>Metal with black matte finish</li> </ul>
<b>Front Panel:</b>	<ul style="list-style-type: none"> <li><b>Program Port:</b> RS-232 DB9 connector (male) can be connected to a DB9 port on a PC. This port can be used with both Serial and NetLinX commands.</li> <li><b>Configuration DIP Switch:</b> Use this DIP switch to set the communication parameters for the Program port.</li> <li><b>IR RX LED:</b> Red LED lights to indicate when IR data is being received via the rear IR RX port.</li> <li><b>IR LED:</b> Red LED lights to indicate transmission of IR or Serial data via the rear IR port.</li> <li><b>I/O LEDs:</b> Four yellow LEDs light when the rear I/O channels 1-4 are active. LED indicator for each I/O port reflects the state of that particular port.</li> <li><b>Serial LEDs:</b> Two sets of red and yellow LEDs light to indicate the rear DB9 Ports 1 &amp; 2 are transmitting or receiving RS-232, 422, or 485 data. These LEDs do not reflect changes in either the RTS or CTS when hardware handshaking is used.</li> <li><b>LINK/ACT:</b> Green LED lights when the Ethernet cable is connected and an active link is established. This LED also blinks when receiving Ethernet data packets.</li> <li><b>Status:</b> Green LED lights to indicate that the system is programmed and communicating properly.</li> <li><b>Output:</b> Red LED lights when the Controller transmits data, sets channels On and Off, sends data strings, etc.</li> <li><b>Input:</b> Yellow LED lights when the Controller receives data from button pushes, strings, commands, channel levels, etc.</li> <li><b>ID Pushbutton:</b> Sets the NetLinX ID (<b>Device only</b>) assignment for the device.</li> </ul>

NI-700 Specifications (Cont.)	
<b>Rear Panel:</b>	<ul style="list-style-type: none"> <li><b>RS-232/422/485 (Ports 1 &amp; 2):</b> Two RS-232/422/485 control ports using DB9 (male) connectors with XON/XOFF (transmit on/transmit off), CTS/RTS (clear to send/ready to send), and 300-115,200 baud.</li> <li><b>IR RX (Port 5):</b> This single port is used to connect one or more (8 maximum) IRX-SM+ swivel mount or IRX-DM+ Decora mount IR receivers. The IR RX port functions using AMX IR codes (38 KHz and 455 KHz) and works ONLY with AMX IR Receivers such as the IRX-DM+ and IRX-SM+.</li> <li><b>Digital I/O (Port 4):</b> Four-channel binary I/O port for contact closure with each input being capable of voltage sensing. Input format is software selectable with interactive power sensing for IR ports.</li> <li><b>IR/Serial (Port 3):</b> This single port is capable of generating IR with the use of an IR emitter (while in IR mode). This port can support high-frequency carriers of up to 1.142 MHz and can also generate IR with no carrier frequency.</li> <li><b>AXlink LED:</b> One green LED indicates the state of the AXlink port.</li> <li><b>AXlink port:</b> 4-pin 3.5 mm mini-Phoenix (male) connector provides data and power to external control devices.</li> <li><b>Ethernet port:</b> LEDs show communication activity, connections, speeds, and mode information:  <ul style="list-style-type: none"> <li><b>L/A-link/activity - Green LED</b> lights On when the Ethernet cables are connected and terminated correctly and blinks when receiving Ethernet data packets.</li> <li><b>SPD-speed - Yellow LED</b> lights On when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps.</li> </ul> </li> <li><b>Power port:</b> 2-pin 3.5 mm mini-Phoenix (male) connector</li> </ul>
<b>Included Accessories:</b>	<ul style="list-style-type: none"> <li>NI-700 Quick Start Guide (93-2105-03)</li> <li>One 6-pin 3.5 mm mini-Phoenix female I/O connector (41-5063)</li> <li>One 4-pin 3.5 mm mini-Phoenix female AXlink connector (41-5047)</li> <li>One 2-pin 3.5 mm mini-Phoenix female PWR connector (41-5025)</li> <li>One CC-NIRC IR Emitter (FG10-000-11)</li> <li>OpenSSL Warranty and Licensing Information (93-2105-05)</li> </ul>
<b>Optional Accessories:</b>	<ul style="list-style-type: none"> <li>2-pin Black Male Phoenix Connector (3.5mm) (41-5026)</li> <li>AC-RK Accessory Rack Kit (FG515)</li> <li>CC-NIRC IR cables (FG10-000-11)</li> <li>CC-NSER IR/Serial cables (FG10-007-10)</li> <li>CSB Cable Support Bracket (FG517)</li> <li>PSN2.8: Power supply (FG423-17)</li> <li>PSN4.4: Power supply (FG423-45)</li> <li>PSN6.5: Power supply (FG423-41)</li> <li>STS, Serial To Screw Terminal (FG959)</li> <li>Surface Mount Bracket Accessory (FG525)</li> </ul>

**Port Assignment and Functionality**

NetLinX Port Assignments	
Port	ICSP Port #
Serial Port 1	1
Serial Port 2	2
IR Port	3
I/O Port	4
IR RX Port	5

**Ethernet Ports used by the NI Controller**

Ethernet Port Usage		
Port type	Description	Standard Port #
FTP	The on-board Master has a built-in FTP server that conforms to RFC959.	21/20 (TCP)
SSH	The SSH port uses SSL as a mechanism to configure and diagnose a NetLinX system. This port value is used for secure Telnet communication. <b>Note: We currently ONLY support SSH version 2.</b>	22 (TCP)
Telnet	The NetLinX Telnet server provides a mechanism to configure and diagnose a NetLinX system.	23 (TCP)
HTTP	The Master has a built-in web server that complies with the HTTP 1.0 specification and supports all of the required features of HTTP v1.1.	80 (TCP)
HTTPS/SSL	The Master has a built-in SSL protected web server.	443 (TCP)
ICSP	Peer-to-peer protocol used for both Master-to-Master and Master-to-device communications.	1319 (UDP/TCP)
Integration Solutions	The feature on the Master uses, by default, port 10500 for the XML based communication protocol. This port is connected to by the client web browser's JVM when Integration Solutions control pages are retrieved from the on-board Master's web server.	10500 (TCP)

## Connections and Wiring

FIG. 2 shows the layout of the connectors and components located on the rear of the NI-700 NetLinX Integrated Controller.

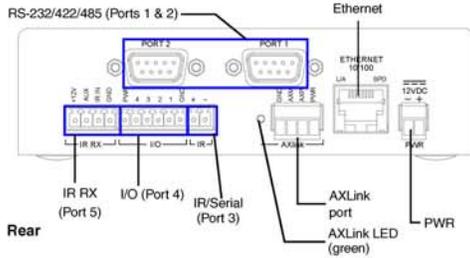


FIG. 2 NI-700 rear connectors and components

### Wiring a power connection

Use any standard PSN power supply (usage dependent) to supply power to the NI-700 through the 2-pin 3.5 mm mini-Phoenix connector on the rear panel (FIG. 2).

The incoming PWR and GND cable from the PSN power supply must be connected to the corresponding locations within the PWR connector. Refer to the *NetLinX Integrated Controllers Instruction Manual* for more detailed wiring connection information.

### RS-232/422/485 wiring connector information

FIG. 3 shows the pinout and wiring specification information for the rear RS-232/RS-422/RS-485 (DB9) Device Ports. These ports support most standard RS-232 communication protocols for data transmission (NI-700 uses Ports 1 & 2).

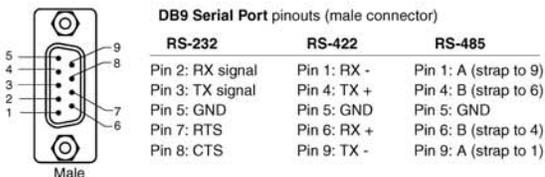


FIG. 3 RS-232/422/485 DB9 (male) connector pinouts

### Ethernet 10/100 Base-T Connector

A standard CAT5 Ethernet cable provides 10/100 network connectivity between the Integrated Controller and the network (FIG. 4).

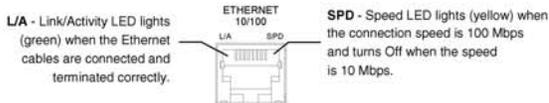


FIG. 4 Layout of Ethernet LEDs

**Note:** On NetlinX Masters (such as those aboard the NI-700), from within the Telnet or Terminal applications: you can send the **SET ETHERNET MODE** command to assign the speed of your Ethernet connection.

Sample NI-700 command:

```
SET ETHERNET MODE AUTO
```

**The NI-700 only allows you to set the Ethernet mode to AUTO negotiate the Ethernet connection speed. Using any of the other connection modes (10 Half/Full or 100 Half/Full) results in an error message.**

### Program Port Baud Rate Settings

The Configuration DIP switch is located on the front panel. Use this DIP switch to set the baud rate for the Program Port, according to the settings shown in the following table. Make sure the baud rate you set matches the baud rate on your PC's NetLinX COM Settings before programming the unit.

**By default, the baud rate is set to 38,400 (bps).**

Baud Rate Settings				
Baud Rate	Position 5	Position 6	Position 7	Position 8
9600 bps	OFF	ON	OFF	ON
38,400 bps (default)	OFF	ON	ON	ON
57,600 bps	ON	OFF	OFF	OFF
115,200 bps	ON	ON	ON	ON

**Note:** DIP switch 1 activates/deactivates the Program Run Disable Mode. DIP Switches 2,3, and 4 must remain OFF at all times.

### Setting the Configuration (Program Port) DIP Switch

1. Disconnect the power supply from the rear 2-pin PWR connector.
2. Set DIP switch positions (according to the information listed in the previous Baud Rate Settings table) and reapply power to the unit.

### Preparing the NI-700 for Serial Communication

1. Launch NetLinX Studio 2.3 (default location is **Start > Programs > AMX Control Disc > NetLinX Studio > NetLinX Studio 2.3**).
2. Select **Settings > Master Communication Settings**, from the Main menu, to open the *Master Communication Settings* dialog box.
3. Click the **Communications Settings** button to open the *Communications Settings* dialog.
4. Click the **NetLinX Master** radio button (from the *Platform Selection* section) to indicate you are working with a NetLinX Master.
5. Click the **Serial** radio button (from the *Transport Connection Option* section) to indicate you are connecting to the Master via a COM port.
6. Click the **Edit Settings** button (on the *Communications Settings* dialog) to open the *Serial Settings* dialog and set the COM port parameters (used to communicate to the NetLinX Master).
7. Click the **OK** button when you are done.
8. Click on the **Authentication Required** radio box (if the Master is secured) and press the **User Name and Password** button to enter a valid username and password being used by the secure Master.
9. Click the **OK** button when you are done and then click it twice more to close the open dialogs and save your settings.
10. Right-click within the **Online** tab and select **Refresh System**.
11. Assign a System Value by using **Diagnostics > Device Addressing** from the Main menu and then entering the current and new system values.
12. Click the **Change Device/System Number** button and when finished click **Done**.
13. Select **Tools > Reboot the Master Controller** to access the *Reboot the Master* dialog, then click **Reboot** to restart the Master and incorporate any changes.
14. Once the dialog replies with "Reboot of system complete", press **Done** and click the OnLine Tree tab in the Workspace window to view the devices on the System. *The default System value is one.*
15. Right-click on the *Empty Device Tree/System* entry and select **Refresh System** to re-populate the list.

### Configuring the NI-700 for Ethernet Communication

Once the Master has been configured according to the steps outlined above, it is ready for Ethernet communication:

1. Connect an Ethernet cable to the units' rear Ethernet connector.
2. Select **Diagnostics > Network Address** from the Main menu and enter the System, Device (0 for a Master), and Host Name information.
3. To configure the Address:
  - Use a DHCP Address by selecting the **Use DHCP** radio button, clicking the **GET IP** button (to obtain a DHCP Address from the DHCP Server), clicking the **SET IP** button (to assign the new address), and then clicking the **Reboot Master > OK** buttons to finish the process.
  - Use a Static IP Address by selecting the **Specify IP Address** radio button, entering the IP parameters into the available fields, clicking the **SET IP** button (to set/specify a pre-reserved IP Address to the Master), and then clicking the **Reboot Master > OK** buttons to finish the process.
4. Complete the process by repeating steps 13 - 15 from the above section.

AMX Corporation reserves the right to alter specifications without notice at any time.  
For full warranty information, refer to the AMX Instruction Manual(s) associated with your Product(s).

93-2105-03 REV: D

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For more detailed installation, configuration, programming, file transfer, and operating instructions, refer to the *NetLinX Integrated Controllers (NI-2100, NI-3100, and NI-4100 Series) Instruction Manual*, available online at [www.amx.com](http://www.amx.com).



FIG. 1 NI-3100 NetLinX Integrated Controller (front view)

### Overview

The NI-3100 unit (FG2105-05) is geared toward those advanced control and automation requirements associated with a larger area or multiple rooms. The NI-3100 provides support for 7 RS-232/RS-422/RS-485 Ports, 8 IR/Serial Output ports, 8 Digital Input/Output ports, and 8 Relays. The NI-3100 can be upgraded to provide 1 ICSHub and 2 ICSNet ports by either installing the optional ICSNet daughter card (FG2105-10) or purchasing this upgrade as an included feature of the NI-3100 Kit (FG2105-15).

### ATTENTION!

Verify you are using the latest NI firmware for the on-board Master. Verify you are using the latest version of NetLinX Studio (available for download from [www.amx.com](http://www.amx.com)).

### Specifications

NI-3100 Specifications	
Dimensions (HWD):	<ul style="list-style-type: none"> <li>3.47" x 17.00" x 3.47" (8.81 cm x 43.18 cm x 8.82 cm)</li> <li>2 rack units high</li> </ul>
Power Requirement:	<ul style="list-style-type: none"> <li>900 mA @ 12 VDC</li> </ul>
Memory:	<ul style="list-style-type: none"> <li>64 MB SDRAM</li> <li>1 MB Non-volatile (NV) SRAM</li> </ul>
Compact Flash:	<ul style="list-style-type: none"> <li>128 MB Card (upgradable) (refer to the Other AMX Equipment section for more information)</li> <li>Refer to the NetLinX Integrated Controllers (NI-2100, NI-3100, and NI-4100 Series) Instruction Manual for more information.</li> </ul>
Weight:	<ul style="list-style-type: none"> <li>4.55 lbs (2.06 kg)</li> </ul>
Enclosure:	<ul style="list-style-type: none"> <li>Metal with black matte finish</li> </ul>
Certifications:	<ul style="list-style-type: none"> <li>FCC Part 15 Class B, CE, and IEC 60950</li> </ul>
Front Panel Components:	<ul style="list-style-type: none"> <li>LINK/ACT: Green LED blinks when the Ethernet cable are connected and terminated correctly. Also blinks when receiving Ethernet data packets.</li> <li>Status: Green LED blinks to indicate that the system is programmed and communicating properly.</li> <li>Output: Red LED blinks when the Controller transmits data, sets channels On and Off, sends data strings, etc.</li> <li>Input: Yellow LED blinks when the Controller receives data from button pushes, strings, commands, channel levels, etc.</li> <li>RS-232/422/485 LEDs: 7 sets of red and yellow LEDs light to indicate the rear DB9 Ports 1 - 7 are transmitting or receiving RS-232, 422, or 485 data.</li> <li>Relay LEDs: Eight red LEDs light to indicate the rear relay channels 1 - 8 are active (closed). These LEDs reflect the state of the relay on Port 8.</li> <li>IR/Serial LEDs: Eight red LEDs light to indicate the rear IR/Serial channels 1 - 8 are transmitting control data on Ports 9 - 16. LED indicator for each IR port remains lit for the length of time that IR/Serial data is being generated.</li> <li>I/O LEDs: Eight yellow LEDs light when the rear I/O channels 1 - 8 are active. LED indicator for each I/O port reflects the state of that particular port.</li> <li>Rack-mount brackets: Provides an installation option for the Integrated Controller to be mounted into an equipment rack, when used with the Installation Kit (KA2105-01).</li> </ul>

### NI-3100 Specifications (Cont.)

Rear Panel Connections:	<ul style="list-style-type: none"> <li>RS-232/422/485 (Ports 1 - 7): Seven RS-232/422/485 control ports using DB9 (male) connectors with XON/XOFF (transmit on/transmit off), CTS/RTS (clear to send/ready to send), and 300-115,200 baud.</li> <li>ICSNet: Two RJ-45 connectors for ICSNet interface (provided by ICSNet daughter card).</li> <li>ICSHub Out: RJ-45 connector provides data to a Hub connected to the Controller (provided by ICSNet daughter card).</li> <li>Relay (Port 8): 8-channel single-pole single throw relay ports with each relay being independently controlled and supporting up to 8 independent external relay devices.</li> <li>Digital I/O (Port 17): 8-channel binary I/O port for contact closure with each input being capable of voltage sensing. Input format is software selectable with Interactive power sensing for IR ports.</li> <li>IR/Serial (Ports 9 - 16): Eight IR/Serial control ports support high-frequency carriers of up to 1.142 MHz with each output being capable of two electrical formats: IR or Serial. Eight IR/Serial data signals can be generated simultaneously. IR ports support data mode (at limited baud) rate and wiring distances.</li> <li>Program Port: RS-232 DB9 connector (male) can be connected to a DB9 port on a PC. This connector can be used with serial and NetLinX programming commands, as well as other DB9 capable devices, to both upload/download information from the NetLinX Studio program.</li> <li>Configuration DIP Switch: Sets the communication parameters for the Program port.</li> <li>ID Pushbutton: Sets the NetLinX ID (Device only) assignment for the device.</li> <li>Ethernet Port: LEDs show communication activity, connection status, speeds, and mode information: <ul style="list-style-type: none"> <li>SPD (speed) - Yellow LED lights On when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps.</li> <li>L/A (link/activity) - Green LED lights On when the Ethernet cables are connected and terminated correctly, and blinks when receiving Ethernet data packets.</li> </ul> </li> <li>AXLink LED: Green LED indicates the state of the AXLink port.</li> <li>AXLink Port: 4-pin 3.5 mm mini-Phoenix (male) connector that provides data and power to external control devices.</li> <li>Power Port: 2-pin 3.5 mm mini-Phoenix (male) connector.</li> </ul>
Included Accessories:	<ul style="list-style-type: none"> <li>2-pin 3.5 mm mini-Phoenix (female) PWR connector (41-5025)</li> <li>4-pin 3.5 mm mini-Phoenix (female) AXLink connector (41-5047)</li> <li>10-pin 3.5 mm mini-Phoenix (female) I/O connector (41-5107)</li> <li>Installation Kit (KA2105-01): <ul style="list-style-type: none"> <li>8-pin Relay Common Strip</li> <li>Four rack mount screws</li> <li>Four washers</li> </ul> </li> <li>Quick Start Guide</li> <li>Two 8-pin 3.5 mm mini-Phoenix female Relay connectors (41-5083)</li> <li>Two CC-NIRC IR Emitters (82-2105-07)</li> </ul>
Other AMX Equipment:	<ul style="list-style-type: none"> <li>2-pin 3.5 mm mini-Phoenix male connector (41-5028)</li> <li>CSB Cable Support Bracket (FG517)</li> <li>CC-NIRC IR cables (FG10-000-11)</li> <li>CC-NSER IR/Serial cables (FG10-007-10)</li> <li>ICSNet daughter card (FG2105-10)</li> <li>NCK, NetLinX Connector Kit (FG2902)</li> <li>STS, Serial To Serial Terminal (FG659)</li> <li>Upgrade Compact Flash (factory programmed with firmware): <ul style="list-style-type: none"> <li>NXA-CF2N256M - 256 MB compact flash card (FG2116-47)</li> <li>NXA-CF2N512M - 512 MB compact flash card (FG2116-48)</li> <li>NXA-CF2N1G - 1 GB compact flash card (FG2116-49)</li> </ul> </li> </ul>

### Ethernet Ports used by the NI Controller

Ethernet Ports Used		
Port type	Description	Standard Port #
FTP	The on-board Master has a built-in FTP server.	2120 (TCP)
SSH	The SSH port uses SSL as a mechanism to configure and diagnose a NetLinX system. This port value is used for secure Telnet communication. <i>Note: We currently ONLY support SSH version 2.</i>	22 (TCP)
Telnet	The NetLinX Telnet server provides a mechanism to configure and diagnose a NetLinX system.	23 (TCP)
HTTP	The Master has a built-in web server that complies with the HTTP 1.0 specification and supports all of the required features of HTTP v1.1.	80 (TCP)
HTTPS/SSL	The Master has a built-in SSL protected web server.	443 (TCP)
ICSP	Peer-to-peer protocol used for both Master-to-Master and Master-to-device communications.	1319 (UDP/TCP)
Integration Solutions	The feature on the Master uses, by default, port 10500 for the XML based communication protocol. This port is connected to by the client web browser's JVM when Integration Solutions control pages are retrieved from the on-board Master's web server.	10500 (TCP)

## Connections and Wiring

FIG. 2 shows the layout of the connectors and components located on the rear of the NI-3100 NetLinx Integrated Controller.

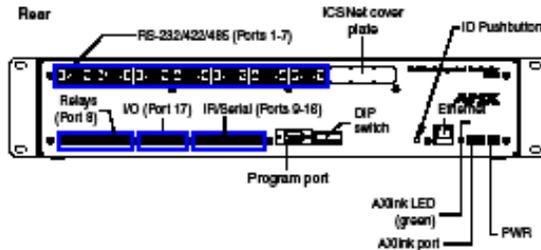


FIG. 2 NI-3100 rear connectors and components

### Wiring a power connection

Use a 12 VDC-compliant power supply to provide power to the Integrated Controller through the rear 2-pin 3.5 mm mini-Phoenix. Use the power requirements information listed in the Specifications table to determine the power draw.

The incoming PWR and GND cable from the PSN power supply must be connected to their corresponding locations within the PWR connector. Refer to the *NetLinx Integrated Controller's* Instruction Manual for more detailed wiring connection information.

### RS-232/422/485 wiring connector information

FIG. 3 shows the pinout and wiring specification information for the rear RS-232/RS-422/RS-485 (DB9) Device Ports. These ports support most standard serial mouse control devices and RS-232 communication protocols for PC data transmission (NI-3100 uses Ports 1 - 7).

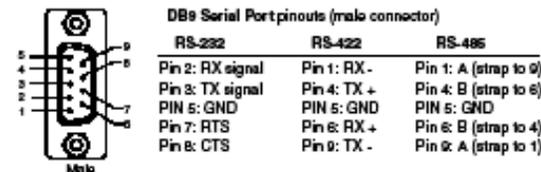


FIG. 3 RS-232/422/485 DB9 (male) connector pinouts

### RJ-45 Connections

Use a standard CAT5 Ethernet cable to provide communication between the Integrated Controller and external NetLinx devices.

#### Ethernet 10/100 Base-T Connector

The Ethernet cable provides 10/100 network connectivity between the panel and the NetLinx Master (FIG. 4).



FIG. 4 Layout of Ethernet LEDs

### Baud Rate Settings

The Program Port DIP switch is located on the rear of the device. Use this DIP switch to set the baud rate for the Program Port, according to the settings shown in the following table. Make sure the baud rate you set matches the baud rate on your PC's NetLinx COM Settings before programming the unit. *By default, the baud rate is set to 38,400 (bps).*

Baud Rate	Position 5	Position 6	Position 7	Position 8
9600 bps	OFF	ON	OFF	ON
38,400 bps (default)	OFF	ON	ON	ON
57,600 bps	ON	OFF	OFF	OFF
115,200 bps	ON	ON	ON	ON

Note: DIP switch 1 activates/deactivates the Program Run Disable Mode. DIP Switches 2,3, and 4 must remain OFF at all times.

### Preparing the NI-3100 for Serial Communication

1. Launch NetLinx Studio 2.x (default location is Start > Programs > AMX Control Disc > NetLinx Studio 2 > NetLinx Studio 2).
2. Select Settings > Master Communication Settings, from the Main menu, to open the *Master Communication Settings* dialog box.
3. Click the Communications Settings button to open the *Communications Settings* dialog.
4. Click the NetLinx Master radio button (from the Platform Selection section) to indicate you are working with a NetLinx Master.
5. Click the Serial radio button (from the Transport Connection Option section) to indicate you are connecting to the Master via a COM port.
6. Click the Edit Settings button (on the *Communications Settings* dialog) to open the *Serial Settings* dialog and set the COM port parameters (used to communicate to the NetLinx Master).
7. Click the OK button three times to return to the main application.
8. Right-click the Online Tree tab entry and select Refresh System.
9. Assign a System Value by using Diagnostics > Device Addressing from the Main menu.
10. Enable the Change System selection by clicking on it and then enter the current and new System values.
11. Click the Change Device/System Number button and when finished click Done.
12. Select Tools > Reboot the Master Controller to access the *Reboot the Master* dialog, then click Reboot to restart the Master and incorporate any changes.
13. Once the dialog replies with "Reboot of system complete", click Done and then click the OnLine Tree tab in the Workspace window to view the devices on the System. *The default System value is one.*
14. Right-click on the *Empty Device Tree/System* entry and select Refresh System to re-populate the list.

### Configuring the NI-3100 for Ethernet Communication

Before continuing, complete the COM port steps above.

1. Connect an Ethernet cable to the unit's rear Ethernet connector.
2. Select Diagnostics > Network Address from the Main menu and enter the System, Device (0 for a Master), and Host Name Information.
3. To configure the Address:
  - Use a DHCP Address by selecting the Use DHCP radio button, then click the GET IP button (to obtain a DHCP Address from the DHCP Server), click the SET IP Information button (to retain the new address), and then finish the process by clicking the Reboot Master > OK buttons.
  - Use a Static IP Address by selecting the Specify IP Address radio button, enter the IP parameters into the available fields, then click the SET IP Information button (to retain the pre-reserved IP Address to the Master), and then click the Reboot Master > OK buttons to finish the process.
4. Repeat steps 1 - 5 from the previous section but rather than selecting the Serial option, choose TCP/IP and edit the settings to match the IP Address you are using (whether Static or IP).
5. Click on the Authentication Required radio box (if the Master is secured) and press the User Name and Password button to enter a valid username and password being used by the secured Master.
6. Click the OK button three times to return to the main application.



For full warranty information, refer to the AMX Instruction Manual(s) associated with your Product(s).

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93-2105-15 REV: B





# Installation Guide

## TPI-PRO-DVI-2/4 Total Presentation Interface with DVI

### Overview

The TPI-PRO-DVI Presentation Interface with DVI displays up to 4 fully-scalable video windows, each supporting Composite, S-Video, Component, VGA and DVI signals on three party touch monitors (FIG. 1).

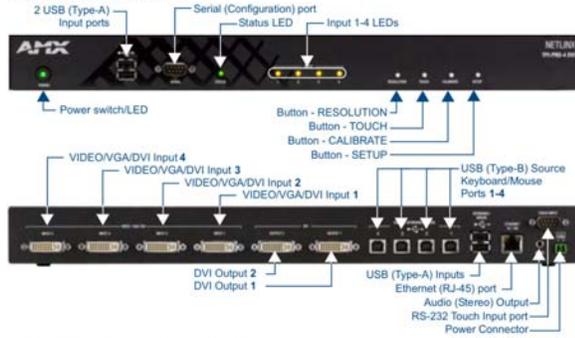


FIG. 1 TPI-PRO-2/4-DVI (TPI-PRO-4-DVI shown)

There are two versions of the TPI-PRO-DVI available:

- **h** TPI-PRO-DVI-2 (FG2275-112) supports up to two DVI inputs.
- **h** TPI-PRO-DVI-4 (FG2275-114) supports up to four DVI inputs.

### Product Specifications

The following table lists the specifications for the TPI-PRO-DVI-2 and TPI-PRO-DVI-4. Note that the primary difference between the TPI-PRO-DVI-2 and TPI-PRO-DVI-4 is in the number of inputs. In terms of functionality and specifications, they are otherwise identical. The specifications listed below apply to both versions, unless specifically noted.

TPI-PRO-DVI Specifications					
<b>Power Requirements:</b>	<ul style="list-style-type: none"> <li>• <b>Instant current draw:</b> 2.6 A @ 12 VDC</li> <li>• <b>PSN6.5 Power Supply (FG423-41 - not included)</b> is recommended, to accommodate all possible configurations and respective power draws.</li> </ul>				
<b>Memory:</b>	<ul style="list-style-type: none"> <li>• <b>5.6 MB SDRAM</b></li> <li>• <b>36 MB disk memory</b></li> </ul>				
<b>Supported Video Resolutions:</b>	<table border="0"> <tr> <td> <b>Input DVI Video:</b> <ul style="list-style-type: none"> <li>• <b>up to 1920x1200</b></li> <li>• <b>single-link DVI only</b></li> </ul> </td> <td> <b>Input Composite Video and S-Video:</b> <ul style="list-style-type: none"> <li>• <b>NTSC/M/J</b></li> <li>• <b>NTSC/4-3</b></li> <li>• <b>RGB/D/I/G/H</b></li> <li>• <b>PAL60</b></li> <li>• <b>PALM/N/C</b></li> <li>• <b>SECAM/D/G/K/L</b></li> </ul> </td> </tr> <tr> <td> <b>Input Component Video:</b> <ul style="list-style-type: none"> <li>• <b>MSC 480i, 480p</b></li> <li>• <b>ML 576i, 576p</b></li> <li>• <b>20p, 1080i, 1080p</b></li> </ul> </td> <td></td> </tr> </table>	<b>Input DVI Video:</b> <ul style="list-style-type: none"> <li>• <b>up to 1920x1200</b></li> <li>• <b>single-link DVI only</b></li> </ul>	<b>Input Composite Video and S-Video:</b> <ul style="list-style-type: none"> <li>• <b>NTSC/M/J</b></li> <li>• <b>NTSC/4-3</b></li> <li>• <b>RGB/D/I/G/H</b></li> <li>• <b>PAL60</b></li> <li>• <b>PALM/N/C</b></li> <li>• <b>SECAM/D/G/K/L</b></li> </ul>	<b>Input Component Video:</b> <ul style="list-style-type: none"> <li>• <b>MSC 480i, 480p</b></li> <li>• <b>ML 576i, 576p</b></li> <li>• <b>20p, 1080i, 1080p</b></li> </ul>	
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<b>Supported Audio Sample Rates:</b>	48000Hz, 44100Hz, 32000Hz, 24000Hz, 22050Hz, 16000Hz, 12000Hz, 11025Hz, and 8000Hz.				
Front Panel Components					
<b>Power switch/LED:</b>	<ul style="list-style-type: none"> <li>• <b>Light Off:</b> Power to the unit is either not plugged in, below approximately 10VDC, above approximately 19VDC, or cross-wired.</li> <li>• <b>Constant Green:</b> Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately), the unit is on, and all internal power supplies are operating normally.</li> <li>• <b>Constant Yellow:</b> Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately) and the unit has been turned off by pressing the power switch for more than two seconds.</li> <li>• <b>Flashing Yellow:</b> Power to the unit is within nominal voltage limits (between 10VDC and 19VDC, approximately), but one or more of the internal power supplies are not operating correctly. The unit needs to be serviced. Contact AMX Technical Support for further instructions.</li> </ul>				
<b>USB Type-A Host ports:</b>	<ul style="list-style-type: none"> <li>• <b>2 USB ports</b> that can be used for a keyboard, mouse, external storage unit, or USB-capable touch panel interface.</li> <li>• <b>Note:</b> Do not use a USB hub to connect multiple USB devices to the TPI-PRO-DVI.</li> </ul>				
<b>Serial port:</b>	RS-232 connector (male) connects to a DB9 serial port on a PC, for serial communication.				
<b>Status LED:</b>	<ul style="list-style-type: none"> <li>• <b>Constant ON:</b> No communication with the NetLinx Master</li> <li>• <b>Flashing:</b> In communication with the NetLinx Master</li> </ul>				
<b>Input LEDs:</b>	<ul style="list-style-type: none"> <li>• <b>Yellow LEDs</b> indicate a valid input signal on each source input (1-4 on the TPI-PRO-DVI-4, 1-2 on the TPI-PRO-DVI-2).</li> </ul>				
<b>Buttons:</b>	<ul style="list-style-type: none"> <li>• <b>our white buttons</b> provide access to the following configuration options: <ul style="list-style-type: none"> <li>• <b>RESOLUTION:</b> Opens a screen used to select the TPI-PRO-DVI output video signal resolution, ranging from 640 x 480@60Hz to 1920 x 1200@60Hz.</li> <li>• <b>Note:</b> This output resolution setting must not be greater than the resolution on the connected panel.</li> <li>• <b>TOUCH:</b> Opens the <b>Panel Information</b> page, where you can select from a series of serial touch panel drivers, and select the driver that corresponds to the serial touch panel connected to the TPI-PRO-DVI (via the TOUCH INPUT connector).</li> </ul> </li> </ul>				

TPI-PRO-DVI Specifications (Cont.)	
<b>Buttons (Cont.):</b>	<ul style="list-style-type: none"> <li>• <b>CALIBRATE:</b> Opens the <b>Calibration</b> page, displaying a series of crosshairs. These crosshairs are used to calibrate the touch device being used.</li> <li>• <b>SETUP</b> Opens the TPI-PRO-DVI firmware setup menu.</li> </ul>
Rear Panel Components	
<b>DVI Inputs:</b>	<ul style="list-style-type: none"> <li>• <b>DVI-I</b> connectors, one per input source (1-4 on the TPI-PRO-DVI-4, 1-2 on the TPI-PRO-DVI-2).</li> <li>• Each input connector supports DVI, VGA graphics, S-video, composite, and component video.</li> </ul>
<b>DVI Outputs:</b>	<ul style="list-style-type: none"> <li>• <b>2 DVI-A/EIA compatible</b> output connectors. Both outputs support DVI-D and analog VGA (RGBHV) outputs.</li> <li>• <b>Maximum output resolution = 1920 x 1200@60 Hz</b></li> <li>• <b>Default output resolution = 1280 x 1024@60 Hz</b></li> <li>• These connectors display video feeds, G4 graphics and external windowed video/graphics inputs.</li> <li>• The DVI-I Outputs can be connected to either: <ul style="list-style-type: none"> <li>• <b>the touch-panel control display</b></li> <li>• <b>the public-view non-touch monitor</b></li> </ul> </li> <li>• <b>Note:</b> The TPI-PRO-DVI does not provide Component (YPbPr) or interlaced outputs. It provides 1920x1080 Progressive RGBHV (the same resolution as 1080p, but it in the RGB color space).</li> </ul>
<b>Source TOUCH, KEYBOARD/MOUSE USB ports:</b>	<ul style="list-style-type: none"> <li>• <b>2 or 4 USB Type-B device ports</b>, one per source computer—for source USB Touch Monitor, mouse/keyboard control (1-4 on the TPI-PRO-DVI-4, 1-2 on the TPI-PRO-DVI-2).</li> <li>• <b>Note:</b> Do not use a USB hub to connect multiple USB devices to the TPI-PRO-DVI.</li> </ul>
<b>USB Touch Monitor, KEYBOARD/MOUSE USB ports:</b>	<ul style="list-style-type: none"> <li>• <b>2 USB Type-A ports</b> that can be used for a keyboard, mouse, external storage unit, or USB-capable touch panel interface.</li> <li>• <b>Note:</b> Do not use a USB hub to connect multiple USB devices to the TPI-PRO-DVI.</li> </ul>
<b>ETHERNET 10/100 port:</b>	<ul style="list-style-type: none"> <li>• <b>RJ-45 port</b> provides 10/100 Mbps communication with the NetLinx Master (via ICSP protocol over Ethernet).</li> <li>• <b>The Ethernet port</b> automatically negotiates the connection speed (10 Mbps or 100 Mbps), and whether to use half duplex or full duplex mode.</li> <li>• <b>This communication</b> is reflected via the front ICSP LED.</li> </ul>
<b>TOUCH INPUT port:</b>	RS-232 (DB9) 9-pin serial port provides connectivity to a pointer device (i.e. touch screen) that requires a serial connection.
<b>AUDIO OUT connector:</b>	3.5mm mini-jack provides stereo output - for use with line-level (0.707 VRMS) non-amplified stereo output only.
<b>Power connector:</b>	3.5mm mini-Phoenix connector.
<b>Serial Touch Drivers:</b>	Go to <a href="http://www.amx.com/techdocs/TPI-PRO_Supported_Touch_Monitors.xls">http://www.amx.com/techdocs/TPI-PRO_Supported_Touch_Monitors.xls</a> to view/download the most recent List of Touch Monitors and USB Touch Drivers Tested with the TPI-Pro (including the most current listing of tested serial touch panel drivers).
<b>USB Drivers:</b>	<ul style="list-style-type: none"> <li>• <b>USB Touch drivers</b> are automatically loaded when the USB Touch Monitor is detected.</li> <li>• <b>Note:</b> Go to <a href="http://www.amx.com/techdocs/TPI-PRO_Supported_Touch_Monitors.xls">http://www.amx.com/techdocs/TPI-PRO_Supported_Touch_Monitors.xls</a> to view/download the most recent List of Touch Monitors and USB / Serial Touch Drivers Tested with the TPI-Pro (including the most current listing of tested USB touch panel drivers).</li> </ul>
<b>Button Assignments:</b>	<ul style="list-style-type: none"> <li>• <b>Button assignments</b> can be modified in TPD4 (not on the TPI-PRO-DVIs.)</li> <li>• <b>Button channel range:</b> 1 - 4000 button push &amp; feedback (per address port)</li> <li>• <b>Button variable text range:</b> 1 - 4000 (per address port)</li> <li>• <b>Button states range:</b> 1 - 256 (General Button; 1 = Off State, 2 = On State)</li> <li>• <b>Level range:</b> 1 - 600 (Default level value 0-255, can be set up to 1-65535)</li> <li>• <b>Address port range:</b> 1 - 100</li> </ul>
<b>Communication/ Programming:</b>	Master communication and programming is available via an Ethernet connection. There are several methods of TPI-PRO-DVI communication and programming available, including DHCP, Static IP, URL, Listen, Auto, NPD (UPD) and URL (UPD). Refer to the <i>TPI-PRO-DVI Operation/Reference Guide</i> for details.
<b>Enclosure:</b>	<ul style="list-style-type: none"> <li>• <b>Material:</b> metal with black matte finish</li> <li>• <b>Operating/ Storage Environment:</b> <ul style="list-style-type: none"> <li>• <b>Operating Temperature:</b> 0° C (32° F) to 40° C (104° F)</li> <li>• <b>Operating Humidity:</b> 5% to 85% RH Non-Condensing</li> <li>• <b>Storage Temperature:</b> -10° C (14° F) to 70° C (158° F)</li> <li>• <b>Storage Humidity:</b> 0% to 85% RH Non-Condensing</li> </ul> </li> </ul>
<b>Dimensions (HWD):</b>	17.2" x 17.00" x 10.54" (4.37 cm x 43.18 cm x 26.77 cm)
<b>Weight:</b>	.25 lbs (3.74 kg)
<b>Certifications:</b>	<ul style="list-style-type: none"> <li>• <b>BHS</b></li> <li>• <b>CE (Class B)</b></li> <li>• <b>CE/EN60950</b></li> </ul>
<b>Included Accessories:</b>	<ul style="list-style-type: none"> <li>• <b>Pin PWR connector (41-5025)</b></li> <li>• <b>Assembly Kit - Four screws and washers (KA0001)</b></li> <li>• <b>Black Ear brackets (60-0900-03)</b></li> </ul>
<b>Other AMX Equipment:</b>	<ul style="list-style-type: none"> <li>• <b>PSN6.5:</b> Power Supply with 3.5 mm mini-Phoenix connector (FG423-41)</li> <li>• <b>C-DVI-5BNCM:</b> DVI-to-5 BNC Male Adapter Cable (FG10-2170-08)</li> <li>• <b>C-DVI-RCA3M:</b> DVI-to-3 RCA Male Adapter Cable (FG10-2170-09)</li> <li>• <b>C-DVI-SVID:</b> DVI-to-S-Video Adapter Cable (FG10-2170-10)</li> <li>• <b>C-DVIM-VGAF:</b> DVI-to-VGA Adapter Cable (FG10-2170-13)</li> </ul>

## Before You Start

The TPI-PRO-DVI has been factory setup with specific touch panel pages. The first splash screen that appears indicates the TPI-PRO-DVI is receiving power, loading firmware, and preparing to display the default touch panel page. When the panel is ready, the AMX Splash Screen is replaced by the initial Panel Setup page.

- **enfy** you are using the latest NetLinx Master firmware.
- **enfy** you are using the latest TPI-PRO-DVI firmware.
- **enfy** the NetLinx Studio program you are using is version **2.8** or higher.
- **enfy** the TPDesign4 program you are using is version **2.11** or higher.

## Connections Overview

FIG. 2 illustrates how all of the basic connections on the TPI-PRO-DVI are used in a basic installation:

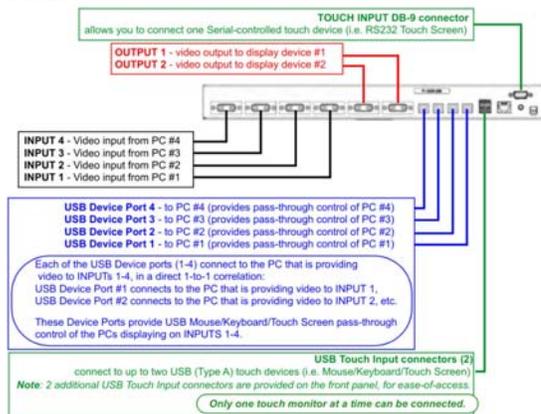


FIG. 2 TPI-PRO-DVI - Basic Wiring Connections

## Cable Details and Pinouts

Refer to the *TPI-PRO-DVI Operation/Reference Guide*.

## Startup Routine and Initial Panel Response

- **Discharge** any acquired static electricity by touching a grounded metal object.
  - **enfy** the rear connections are secure and active.
1. **Connect** the 12VDC Power Supply to the PWR connector on the rear panel. The TPI-PRO-DVI will power ON and initialize the startup routine when the power supply is connected.  
**Note:** Once power is applied, use the Power button to toggle the unit off and on.
  2. **test** the startup routine, the connected touch monitor displays one of two possible screens:
    - If the TPI-PRO-DVI output resolution matches that of the touch monitor, continue by setting the touch drivers associated with the touch monitor. Refer to the *Setting the Touch Drivers (Serial Touch Monitors Only)* section of the *TPI-PRO-DVI Operation/Reference Guide* for details.
    - If the TPI-PRO-DVI's output resolution does not match the resolution of the connected touch monitor, you must set the output resolution of the TPI-PRO-DVI to match the touch monitor.

**Note:** An "OUT OF RANGE" message is often generated by the touch monitor. Some monitors will not display a message, but will appear blank instead.

## Setting the Output Resolution

The TPI-PRO-DVI's output resolution must match the output pixel resolution and refresh rate set on the connected touch monitor.

- **hdf** default output resolution is **1280 x 1024 @ 60Hz**.
  - **hdf** maximum output resolution is **1920 x 1200 @ 60 Hz**.  
**Note:** The TPI-PRO-DVI does not provide Component (YPbPr) or Interlaced outputs. It provides 1920x1080 Progressive RGBHV (the same resolution as 1080p, but it in the RGB color space).
  - **sd** the RESOLUTION pushbutton to alter the outgoing resolution to match the output pixel resolution and refresh rate set on the connected touch monitor.
1. **Prhss** RESOLUTION pushbutton to open the Resolution Setup page.
  2. **Prhss** RESOLUTION button again to cycle through the available output resolution settings.
    - **vsy** consecutive button push cycles the output resolution to the next highest setting.
    - **o**ble-push the RESOLUTION button to return to the previous setting.
    - **ofa** listing of available pixel display and refresh rates, refer to the *TPI-PRO-DVI Operation/Reference Guide*.
  3. The message *Please wait, loading new resolution...* indicates that the new resolution setting is being saved. Do not remove power while the new settings are being saved.
  4. **Oparr** resolution is selected, you can use the outer screen area lines on the Resolution Setup page to adjust your monitor's visible screen area.
    - **hdf** could involve using the monitor's video control to stretch and move the incoming video so that the borders follow the edges of the screen without disappearing.

- **hdf** are normally 60 seconds before the resolution times-out, but you can press the front panel RESOLUTION button again to return to the previous resolution pattern and continue setting up the monitor.
5. **Prhss** hold the RESOLUTION button to save the resolution setting and exit the Resolution Setup page.

**Note:** When the new output resolution is applied, there may be some shifting of the default Main page, as it was developed for 1280 x 1024.

## Setting the Touch Drivers (Serial Touch Monitors Only)

After matching the resolution between the TPI-PRO-DVI and panel/monitor, the next step is to select the necessary touch drivers from the driver set provided by the TPI-PRO-DVI.

- **hdf** step only applies to serial touch monitors, as USB monitors are automatically detected.
  - **hdf** touch drivers are set when you connect the TPI-PRO-DVI to a touch monitor.
  - **hdf** default Touch Input Driver is **EloTouch**®.
  - **Ifyare** using a non touch-enabled monitor, select **NullTouch**.
1. **Prhss** the TOUCH pushbutton on the front panel to open the Panel Information page.
  2. **Prhss** the front panel TOUCH button to cycle through the list of available Touch Input Drivers.

**Note:** Go to <http://www.amx.com/techdocs/TPI-PRO.Supported.Touch.Monitors.xls> to view/download the most recent List of Touch Monitors and USB Touch Drivers Tested with the TPI-PRO-DVI (including the most current listing of tested serial touch panel drivers).

Verify that the selected Touch Input Driver matches the connected touch monitor. Refer to the Available Pixel Display and Refresh Rates section in the *TPI-PRO-DVI Operation/Reference Guide* for a comprehensive list of Touch Monitors that have been tested with the TPI-PRO-DVI.

## Calibrating the TPI-PRO-DVI

If the wrong touch driver is selected prior to the calibration process, press any of the front-panel pushbuttons to exit the calibration process and re-select another touch driver.

If you are using a non touch-enabled monitor, do not press the calibrate button. Refer to the *TPI-PRO-DVI Operation/Reference Guide* for screen adjustment procedures.

## Calibrating the TPI-PRO-DVI Using a USB Input

1. **Conn** a USB cable from a touch panel to one of the Type-A USB ports on the front or back of the TPI-PRO-DVI.
2. **Prhss** the POWER button on the front panel to reboot the TPI-PRO-DVI and allow the unit to detect the new hardware.
3. **Prhss** the CALIBRATE button on the front panel to open the Calibration page.
4. **Prhss** the crosshairs to set the calibration points on the LCD.
5. **test** the "Calibration Successful" message appears, press anywhere to return to the Setup page. If the calibration fails, attempt to calibrate again. If unsuccessful, call AMX Tech Support.

**Note:** It is recommended that you calibrate the TPI-PRO-DVI before its initial use, after completing a firmware download, and after switching Touch Input Drivers (and touch devices.)

6. **Prhss** the Protected Setup button (located on the lower-left of the panel page) to open the Protected Setup page.
7. **ent** **1988** in the Password field and press Done when finished.
8. **Prhss** the on-screen Reboot button to cycle power to the TPI-PRO-DVI and incorporate the new settings. The touch monitor will go blank for a few seconds during the reboot process.

## Calibrating the TPI-PRO-DVI Using a Serial Touch Panel

1. **Conn** a DB9 cable from a touch panel to the DB-9 touch input connector on the back of the TPI-PRO-DVI.
2. **Prhss** the POWER button on the front panel to reboot the TPI-PRO-DVI and allow the unit to detect the new hardware.
3. **Prhss** the CALIBRATE button on the front panel. This process opens a calibration page that uses a series of crosshair coordinate intersections to calibrate the touch panel (using the newly selected touch driver).

**Note:** If the wrong touch driver is selected prior to the calibration process, press any front-panel button to exit the calibration process and re-select another touch driver.

4. **Prhss** the crosshairs (on the Calibration page) to set the calibration points on the LCD.
5. **test** the "Calibration Successful" message appears, press anywhere to return to the Setup page. If the calibration fails, return to the Protected Setup page and select another touch input driver.

**Note:** It is recommended that you calibrate the TPI-PRO-DVI before its initial use, after completing a firmware download, and after switching touch input drivers (and touch devices.)

6. **Prhss** the Protected Setup button (located on the lower-left of the panel page) to open the Protected Setup page.
7. **ent** **1988** into the Keypad's password field and press Done when finished.
8. **Prhss** the on-screen Reboot button to cycle power to the TPI-PRO-DVI and incorporate the new settings. The touch monitor goes blank for a few seconds during the reboot process. You can also use a mouse to press the on-screen Reboot button.
9. **At** start-up, press anywhere on the screen to return to the Protected Setup page and begin defining the communication properties (refer to the *TPI-PRO-DVI Operation/Reference Guide* for information).

## Additional Documentation

For detailed cabling, installation, configuration, programming, and operating instructions, refer to the *TPI-PRO-DVI Operation/Reference Guide* available on-line at [www.amx.com](http://www.amx.com).

For full warranty information, refer to the AMX Instruction Manual(s) as associated with your Product(s).

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### Overview

The NXD-700i (FG2258-10) is an incredibly versatile user interface, combining a sleek, compact size, Wall/Flush Mount flexibility and the ability to create a high quality digital home office intercom network or to make/receive digital local, long distance and international telephone calls.

Simply add the AMX SIP Communications Gateway (FG2182-0x) for calls that sound incredibly clear.



FIG. 1 NXD-700i (shown with Trim Ring 60-2258-26)

### ATTENTION!

Verify you are using the latest *NetLinx Master* and *Modero touch panel* firmware (available from [www.amx.com](http://www.amx.com)). Verify the *TPDesign4* program being used is *Version 2.6* or higher, and download the latest *G4 Support Files* from [www.amx.com](http://www.amx.com).

### Specifications

NXD-700i Specifications	
Dimensions (HWD):	
NXD-700i (Faceplate included)	5.93" x 7.87" x 3.28" (15.06 cm x 20.00 cm x 8.33 cm)
CB-TPT (optional Rough-In Box)	5.47" x 7.25" x 3.40" (13.90 cm x 18.40 cm x 8.64 cm)
Power Requirements:	<ul style="list-style-type: none"> <li>PoE Powered - No local power supply needed</li> <li>Max power draw: 5.5W</li> </ul>
Memory:	<ul style="list-style-type: none"> <li>128 MB SDRAM</li> <li>256MB Integrated Flash Memory (not upgradeable - factory programmed)</li> </ul>
Weight:	1lb (0.45kg)
Panel LCD Parameters:	<ul style="list-style-type: none"> <li>Aspect ratio: 16 x 9</li> <li>Brightness (luminance): 300 cd/m<sup>2</sup></li> <li>Contrast ratio: 400:1</li> <li>Display colors: 256 thousand colors (16-bit color depth)</li> <li>Dot/pixel pitch: 0.19 mm</li> <li>Panel type: TFT Color Active-Matrix</li> <li>Screen Resolution: 800 x 480 pixels (HV) @ 60 Hz frame frequency</li> </ul>
Active Screen Area:	6.00" x 3.80" (15.24cm x 9.14cm)
Viewing Angle:	Up/Down/Left/Right: 70/60/0/0
IR Reception Angle:	<ul style="list-style-type: none"> <li>Horizontal: ± 50° (left and right from center)</li> <li>Vertical: ± 30° (up and down from center)</li> </ul>
Supported Audio Sample Rates:	48000Hz, 44100Hz, 32000Hz, 24000Hz, 22050Hz, 16000Hz, 12000Hz, 11025Hz, and 8000Hz
Intercom:	Full duplex VoIP capabilities
Video Capabilities:	Supports DynaMo™ (M-JPEG), including DynaMo Resource (enhanced M-JPEG) images. Refer to the TPDesign4 online help and NXD-700i / NXT-CA7 Operator/Reference Guide for details on configuring DynaMo and DynaMo Resource images.
Front Panel:	<ul style="list-style-type: none"> <li>Light Sensor: Photosensitive light detector for automatic adjustment of the panel brightness.</li> <li>Motion Sensor (PIR): Proximity Infrared Detector to wake the panel when panel is approached.</li> <li>Front Bezel Button: Provides both access to the setup and calibration pages and toggles the panel between "sleep" or "wake" state. This button is also user-programmable.</li> <li>Microphone: Frequency response of 300 to 3400Hz; used for intercom applications.</li> <li>Speaker: Output of 40hm, 2 Watt, with a 300Hz low cutoff frequency</li> </ul>

### NXD-700i Specifications (Cont.)

Side Panel Connectors:	<ul style="list-style-type: none"> <li>Ethernet 10/100 Port: RJ-45 port for 10/100 Mbps communication. The Ethernet port automatically negotiates the connection speed (10 Mbps or 100 Mbps), and whether to use half duplex or full duplex mode.</li> <li>Power is supplied through Power Over Ethernet (PoE). NXD-700i panels communicate with the NetLinx Master using the ICSIP protocol over Ethernet.</li> <li>LEDs show communication activity, connections, speeds, and mode information:</li> <li>Link Activity - Yellow LED lights On when Ethernet cables are connected and terminated correctly and then blinks when receiving Ethernet data packets.</li> <li>SPD-speed - Green LED lights On when the connection is 100 Mbps and turns off when the speed is 10 Mbps.</li> <li>Mini-USB Connector: 5-pin Mini-USB connector used for programming, firmware update, and touch panel file transfer between the PC and the target panel. The connector is also used for providing audio output for external speakers.</li> </ul>
Operating/Storage Environments:	<ul style="list-style-type: none"> <li>Operating Temperature: 0° C (32° F) to 40° C (104° F)</li> <li>Operating Humidity: 20% - 85% RH</li> <li>Storage Temperature: -20° C (-4° F) to 60° C (140° F)</li> <li>Storage Humidity: 5% - 85% RH</li> </ul>
Certifications:	<ul style="list-style-type: none"> <li>FCC Part 15 Class B and CE</li> <li>IEC60950</li> <li>RoHS</li> </ul>
Included Accessories:	<ul style="list-style-type: none"> <li>Installation Kit for NXD-700i panels (KA2258-02)</li> <li>- 4 Phillips-head screws (#4-40 x 0.250 Black) (80-0112)</li> <li>- 3 Drywall clips (82-5024-05)</li> <li>- 3 #6 sheet metal screws (80-0182)</li> <li>- Trim Ring with button openings (80-2258-26)</li> <li>- Trim Ring without button openings (80-2258-25)</li> </ul>
Other AMX Equipment:	<ul style="list-style-type: none"> <li>NXA-RK7 Rack Mount Kit (FG2904-53)</li> <li>CB-TPT Rough-In Box (FG235-10)</li> <li>PS-POE-AF PoE Injector (FG423-80)</li> <li>CC-USB Type-A to Mini-B5-wire programming cable (FG10-5985)</li> <li>USB to Headphone Adaptor (FG5988-23)</li> <li>AMX SIP Communications Gateway (FG2182-0x)</li> </ul>

### Installing the NXD-700i

Consult the NXD-700i Touch Panels Operator/Reference Guide for the various supported installation methods and dimensions.

### Panel Connectors

FIG. 2 shows the connectors located on the NXD-700i:

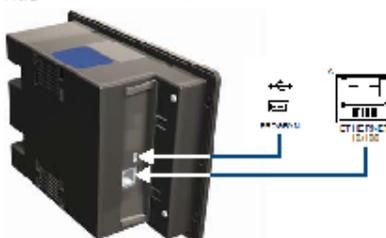


FIG. 2 Connector layout on the NXD-700i

- The mini-USB port is used both for programming the touch panel and for audio output.
- The mini-USB port automatically detects the presence of a headphone adaptor, allowing the port to be used for headphone connectivity.

Note: For more information on connection and use of the Panel Connectors, as well as information on programming and headphone connectivity, please refer to the NXD-700i Operator/Reference Guide, available at [www.amx.com](http://www.amx.com).

## Appendix C – Installation Checklist

<b>Project:</b>					
<b>Project No.:</b>					
<b>Project Mgr:</b>					
<b>Client:</b>					
<b>Account:</b>					
		<i>Tick</i>		Fault	Action
		OK	N/A		
<b>LIGHTING</b>					
	Fluoros				
	Downlights				
	Reading lights				
	Aisle lights				
	Board lights				
	Spotlights				
	Lecture in Progress lights				
	Other				
	Dim settings suitable?				
	Dim rates OK				
	Shadows or wash on screens				
	Manual over-ride works (switchboard)				
	Door switches work				
	Mimic panel controls				
	Touchpanel controls OK				
	PIR activates lights				
<b>POWER</b>					
	AMX power switching				
	Inactivity warning works (set MINUTES to TIMEOUT - 15)				
	Inactivity shutdown (set MINUTES to TIMEOUT)				
	After-hours shutdown (set time to 23:59:55)				
	Power-up after auto-shutdown OK				
	Power-up after AMX reboot (Cycle AMX power)				
<b>NETWORK</b>					
	PC port active				
	Laptop port active				
	AMX port active				
	Subnet labels				
	Note port numbers - PC				
	- Netlinx				
	- Projector(s)				
	- TPI				
<b>PHONE</b>					

	Works				
	Secure				
<b>AMX</b>					
	IP Address				
	URL				
	Device numbers OK				
	System number set				
	Date & time set				
	Security setup				
	On network (ping)				
	Web control working				
	TPI mouse type set				
	TPI LCD monitor adjusted				
	VP security test				
	TPI windows adjusted for best image				
	CV5/CV7 Sensors set up				
<b>EQUIPMENT CHECK</b>					
<b>Projector</b>					
	On/off switching				
	Input switching				
	Screen fit				
	Focus				
	Image stable?				
	Lamp reporting				
	Lamp setting correct				
	Audio				
	Status on				
	IP address correct				
	Secure				
	Turn illuminated label off				
<b>PC</b>					
	Correct HDD image				
	On network (QUT Home Page)				
	Reads CD, CDR				
	Plays DVD				
	Audio out				
	Audio record test				
	USB cable works				
	All USB ports work (test)				
	Mouse cable secure & long enough				
	K/board cable secure & long enough				

	Fans normal (noise level)				
	Remote re-boot works				
	Secured				
	<b>Laptop</b>				
	VGA/HDMI test				
	Audio test				
	Network test				
	cables long enough				
	cables neatly bundled				
	<b>Document Camera</b>				
	Function check				
	- lighting				
	- focus				
	- zoom				
	- arm operation				
	AMX control				
	Image OK				
	Cables neat & secured				
	Unit secure				
	<b>DVD – if installed</b>				
	Function check				
	- Play				
	- Stop				
	- Pause				
	- F/fwd				
	- Rewind				
	- Eject				
	- Menu operation (DVD)				
	- Skip fwd/back (DVD)				
	- Audio level				
	Eject on power down				
	Video window OK				
	Secure				
	<b>Ext. Video Input</b>				
	Switching OK				
	Video OK				
	Audio level OK				
	Labelled				
	<b>AUDIO</b>				
	Lectern mic level				
	Radio mic level				
	Radio mic channels set				
	Radio mic dead-spots				
	Prog levels balanced				
	Default levels OK				
	AMX control OK				

	Mute/un-mute OK				
	Levels OK at startup				
	Mixer setting saved to file				
	Radio mic antennae OK				
<b>Hearing Assistance</b>					
	Test with receiver				
	On/Off switch accessible?				
	Signage in place				
<b>ROH Feeds</b>					
	Check video				
	Check audio				
<b>Bench</b>					
	Reading light				
	All locks work OK				
	Anchored to floor				
	Cables neat & secure				
	All barcodes visible				
	Blanks & vents fitted				
	Wiring diagram in bench (AV5 & above)				
	Wiring diagram to local AV (AV5 & above)				
<b>Room</b>					
	Rubbish removed				
	Ceiling tiles fitted				
	Panel/blanks fitted				
	Any damage?				
<b>TRAINING</b>					
	Client Instruction				
	Local AV Staff instruction				
<b>ASSETS</b>					
	If a CTS or full maintenance contract, fixed assets to stay with LE				
	If none of the above transfer fixed assets to owner				
<b>NOTES</b>					

# Appendix D

## *Roles & Responsibilities*

**Project:** ..... **Contractor** .....

Item or Task	Contractor	QUT
<b>Supply:</b>		
All equipment		
Projector mount		
Screen		
Rack		
Benchtop & frame		
Network cables		
Signal cables		
Mounting hardware		
AMX code		
Padlocks		
Alarm		
<b>Configure:</b>		
Configure AMX network & system settings		
Configure projector network settings		
Security		
<b>Install:</b>		
Locks to equipment & furniture		
Signal cables		
Fitout AV rack		
Assemble & install bench		
Projector & mount		
Screen		
GPOs		
Network ports		