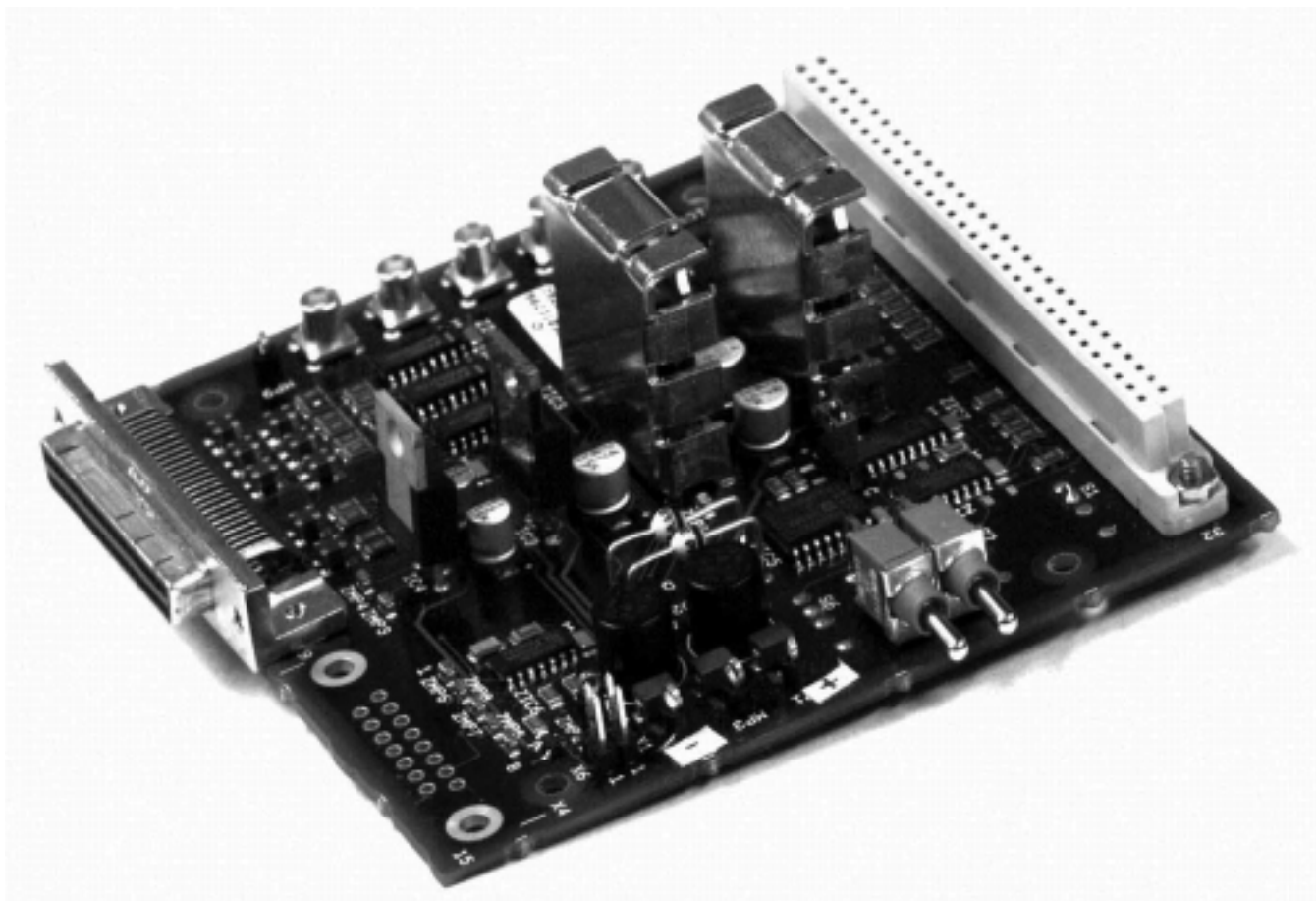


Narragansett Imaging

RS422 Interface Board for FFM3020 IB-3020-422



User Manual

April 2001

Narragansett Imaging

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1. Introduction

The IB-3020-422 is provided as a means to quickly setup and operate *Narragansett Imaging's* FFM3020 OEM camera module. It is not necessarily a component which can be incorporated into an OEM end product as its mechanical configuration and interface are not optimized to this end. The board does provide electromechanical interface to the FFM3020, RS422 drivers, a basic power supply interface, some simple mode control through mechanical switches and a connector which permits cabling to a frame grabber.

2. Getting Started

Begin by plugging the FFM3020 board camera into the connector marked X2 on the interface board. The frame grabber cable can be plugged into connector X5. Cables for Image Technology PCI frame grabbers and Bitflow Roadrunner digital frame grabbers can be supplied. A dual DC power supply is required and connections are made at the points listed in the table below. Please refer to the schematic diagram and assembly diagrams contained in appendix A as you read the subsequent sections of this manual.

3. DC Power Supply Inputs

The interface board requires a DC power supply as indicated below. The FFM3020 operating voltages are generated by on board linear regulators.

<i>PCB Pin ID</i>	<i>Schematic label</i>	<i>Function</i>
MP1	+15V-IN	+15V DC @1A Max
MP2	-15V-IN	-15V DC @200mA Max
MP3	GND-IN	Power ground

4. Mode Control

Operating modes of the camera are controlled by toggle switches S3,4. The mode control via toggle switches is enabled when S5 shorting jumper is in position A-C. S1 and S2 are hard wired so that the output data drivers are enabled and the oscillator is always enabled.

<i>Switch Ref</i>	<i>Mode</i>	<i>SW Position</i>	<i>State</i>	<i>Function</i>
S1	OE	Hard wired	Logic 0	Data output enabled
S2	XTAL-EN	Hard wired	Logic 1	Oscillator enabled
S3	No function	UP	Logic 1	
		DOWN	Logic 0	
S4	IT control	UP	Logic 1	IT control mode*
		DOWN	Logic 0	Continuous readout

* During the IT Control mode, an active low integration control pulse can be applied to the camera through connector X1 pin 1. The schematic shows this input as a label "Lens Contact" and its ground is at X1 pin 2. The input pulse can be a simple mechanical switch. There is a conditioning circuit following the connector input which will de-bounce the mechanical contact. The integration control input pulse to the FFM3020 module must be made active high by installing ZR62 and removing ZR63.

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5. Output Connections

Connector X5 contains the RS422 data and synchronization output. It is a 50 Pin SCSI connector (AMP#787169-5) with the following pin out. Connector mates with AMP #749621-5 or equivalent.

<i>X5 Pin #</i>	<i>Schematic name</i>	<i>Function</i>
25	GND	Ground
24 / 49	D0-FG+ / D0-FG-	Data bit D0 pos. / neg. Output is RS422 compatible
23 / 48	D1-FG+ / D1-FG-	Data bit D1 pos. / neg. Output is RS422 compatible
22 / 47	D2-FG+ / D2-FG-	Data bit D2 pos. / neg. Output is RS422 compatible
21 / 46	D3-FG+ / D3-FG-	Data bit D3 pos. / neg. Output is RS422 compatible
20 / 45	D4-FG+ / D4-FG-	Data bit D4 pos. / neg. Output is RS422 compatible
19 / 44	D5-FG+ / D5-FG-	Data bit D5 pos. / neg. Output is RS422 compatible
18 / 43	D6-FG+ / D6-FG-	Data bit D6 pos. / neg. Output is RS422 compatible
17 / 42	D7-FG+ / D7-FG-	Data bit D7 pos. / neg. Output is RS422 compatible
16 / 41	D8-FG+ / D8-FG-	Data bit D8 pos. / neg. Output is RS422 compatible
15 / 40	D9-FG+ / D9-FG-	Data bit D9 pos. / neg. Output is RS422 compatible
14 / 39	D10-FG+ / D10-FG-	Data bit D10 pos. / neg. Output is RS422 compatible
13 / 38	D11-FG+ / D11-FG-	Data bit D11 pos. / neg. Output is RS422 compatible
10	D12-FG	Reserved
11	D13-FG	Reserved
7 / 32	H-FG+ / H-FG-	H pulse pos. / neg. Output is RS422 compatible
9 / 34	V-FG+ / V-FG-	V pulse pos. / neg. Output is RS422 compatible
4 / 29	PCLK-FG+ / PCLK-FG-	Pixelclock pos. / neg. Output is RS422 compatible
26	CAM-DRIVE-FG	Reserved

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6. Interface Board Measuring Points

Measuring points listed in the table below can be used to verify functionality.

<i>Measuring point</i>	<i>Schematic name</i>	<i>Function</i>
ZMP1	+12V PWR	+12V DC
ZMP2	+5V PWR	+5V DC
ZMP3	-12V PWR	-12V DC
ZMP4	-5V PWR	-5V DC
ZMP5	IT-CONTROL	Integration control pulse
ZMP6	H-2PC	Scope trigger H pulse
ZMP7	V-2PC	Scope trigger V pulse
MP9	GND	Ground reference
MP10	GND	Ground reference

7. Additional Measuring Points

Coax connections are provided as additional test points for the signals as indicated.

<i>Connector ID</i>	<i>Schematic name</i>	<i>Function</i>
X3	H-ext.	Scope triggering H (Rout 75 Ohm CMOS)
X7	V-ext.	Scope triggering V (Rout 75 Ohm CMOS)
X8	Reserved	Reserved
X9	Reserved	Reserved
X10	Pxlclk-ext.	Scope triggering pixel clock (Rout 75 Ohm CMOS)

8. Ordering code

The ordering code for the RS422 Interface board for the FFM3020 is **IB-3020-422**.

9. Technical Support

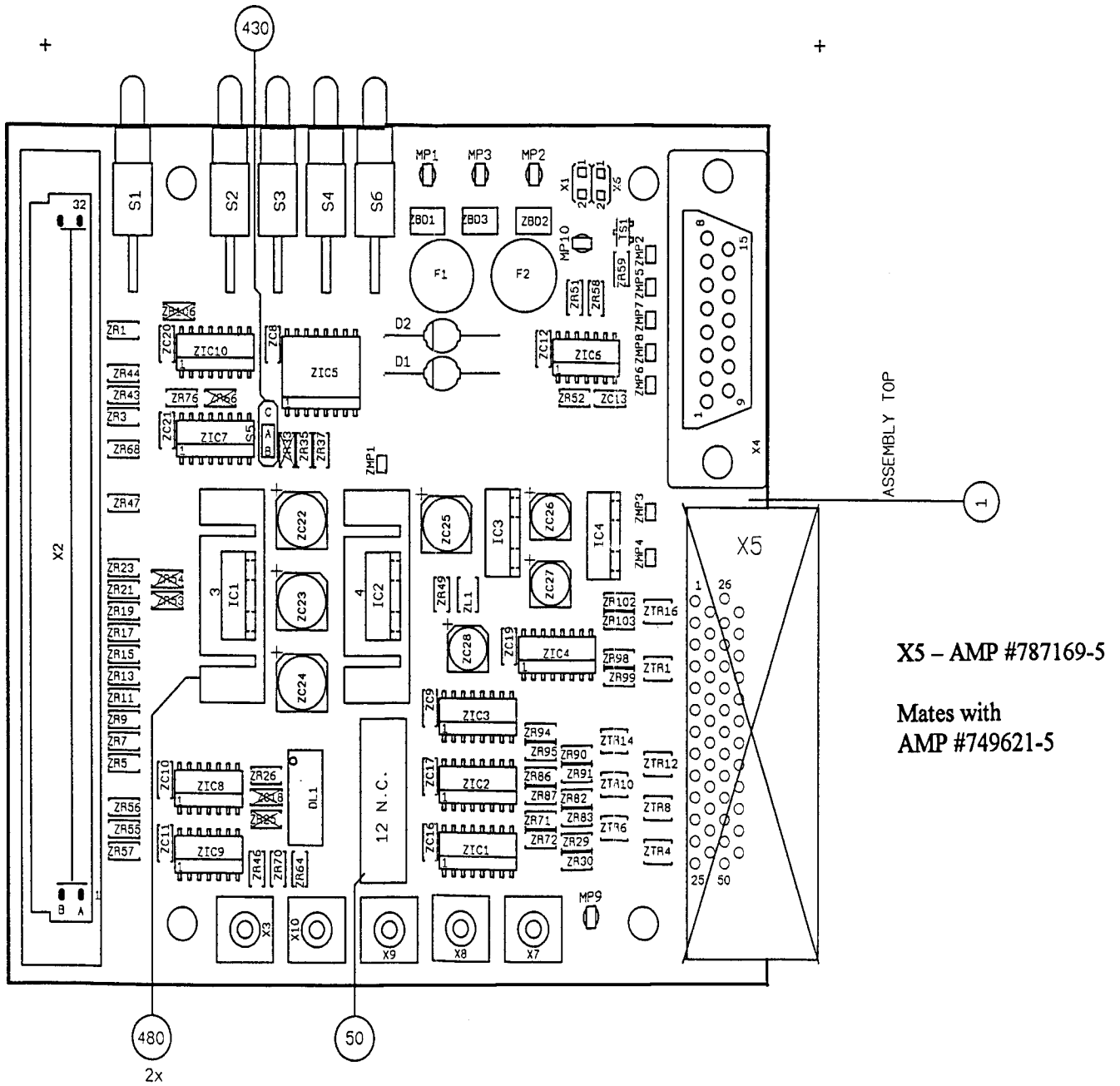
Please direct all questions and comments to:

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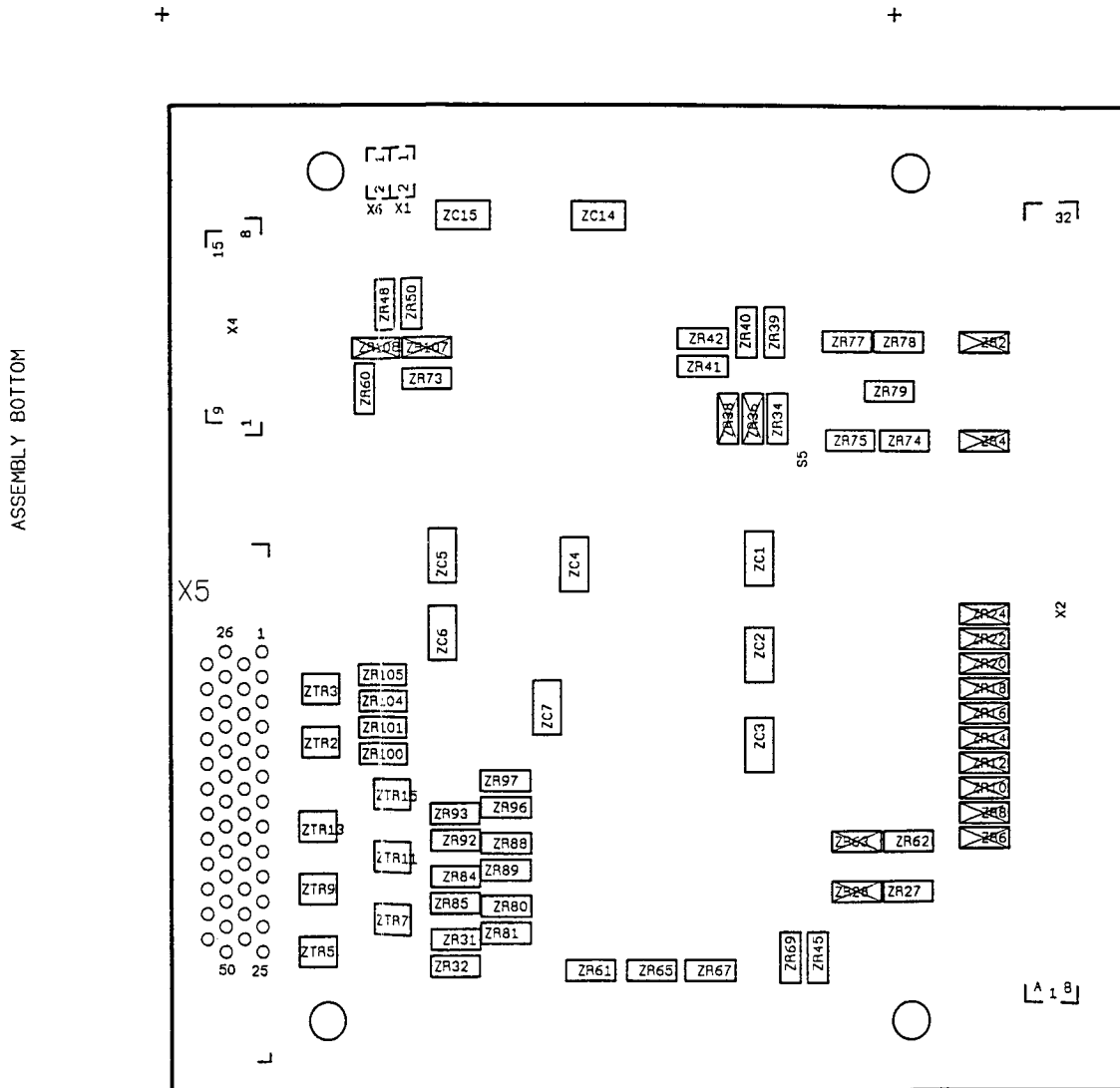
Appendix 2., Diagram 1. Assembly top IB-3020-422

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Appendix 2., Diagram 2. Assembly bottom IB-3020-422



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