Model 3615-L2A

6-channel, 100 MHz Counter

INSTRUCTION MANUAL

October, 1988

**** SPECIAL OPTION ****

MODEL 3615-S002

6-CHANNEL, 100 MHZ COUNTER

DECEMBER 1984

**** SPECIAL OPTION ****

Model 3615-S002

The Model 3615-S002 is a 3615-L2A with all integrated circuits loaded in sockets.

Model 3615

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6-channel 100 MHz Counter

Features

- **Six independent counters**
- **Maximum counts of 16,777,215**
- **LAM status bit set on counter overflow**
- **NIM standard inputs**
- **Input rates from dc to 50 megahertz**
- **Ten nanosecond paired pulse resolution**

Typical Applications

- **Event counting**
- **Nuclear counting**
- **Frequency measurement**
- **Totalizing**

General Description *(Product specifications and descriptions in this document subject to change without notice.)*

The 3615 is a single-width CAMAC module that contains six independent 24-bit counters. These counters accept terminated NIM* signals at rates from dc to 100 megahertz. Minimum pulse width is three nanoseconds. Each counter has an overflow bit that is set on a carry from either bit 16 or bit 24 and generates a LAM, if enabled. The pattern of overflow bits in a module can be read. An overflow output for each counter can be wired to a rear-panel PC edge connector for cascading counters. The counters can be inhibited by Dataway Inhibit or by a front-panel inhibit (I) signal. They can be individually cleared by Dataway command or as a group by Dataway Clear or front-panel signal (C). The input is protected for a ±50 volt transient or ±4 volts dc. Counter inputs are terminated in 50 ohms while inhibit and clear inputs are bridged high impedance.

When precise timing of sequenced events is required, the Model 3655 Timing module provides a time base for the 3615 by asserting the Dataway Inhibit line for a programmable interval. A front-panel switch enables the inhibiting of counting by the Dataway Inhibit line.

When the count in any counter reaches 2^{24} (or 2^{16} if selected by a jumper), the counter rolls over and continues to count, and a corresponding overflow LAM status bit is set. The six LAM status bits are ORed and, when enabled, produce a LAM request. The pattern of the six LAM status bits can be read to locate the specific counter that overflowed.

* The nominal NIM signal is: −16 mA into 50 ohms for a logical 1, and 0 mA for a logical 0.

Function Codes

Command		Q	Action
F(0)·A(i)	RD1	1	Reads the Counter i.
F(1)·A(12)	RD2	1	Reads the LAM Status register.
F(2)·A(i)	RC1	1	Reads the Counter i and clears the Counter i and the LAM Status i.
F(8)·A(0)	TLM	LR	Tests whether a LAM request is present.
F(9)·A(i)	CL1	1	Clears the Counter i and the LAM Status i.
F(10)·A(i)	CLM	1	Clears the LAM Status i.
F(24)·A(0)	DIS	1	Disables the LAM request.
F(25)·A(0)	XEQ	1	Increments all counters.
F(26)·A(0)	ENB	1	Enables the LAM request.
C	CC	0	Clears all counters and the LAM Status register.
Z	CZ	0	Clears all counters and LAM Status register, disables the LAM request.

Notes: i can range from 0 to 5.
Dataway Inhibit (I) prevents counting.
X = 1 for all valid addressed commands.

Simplified Block Diagram
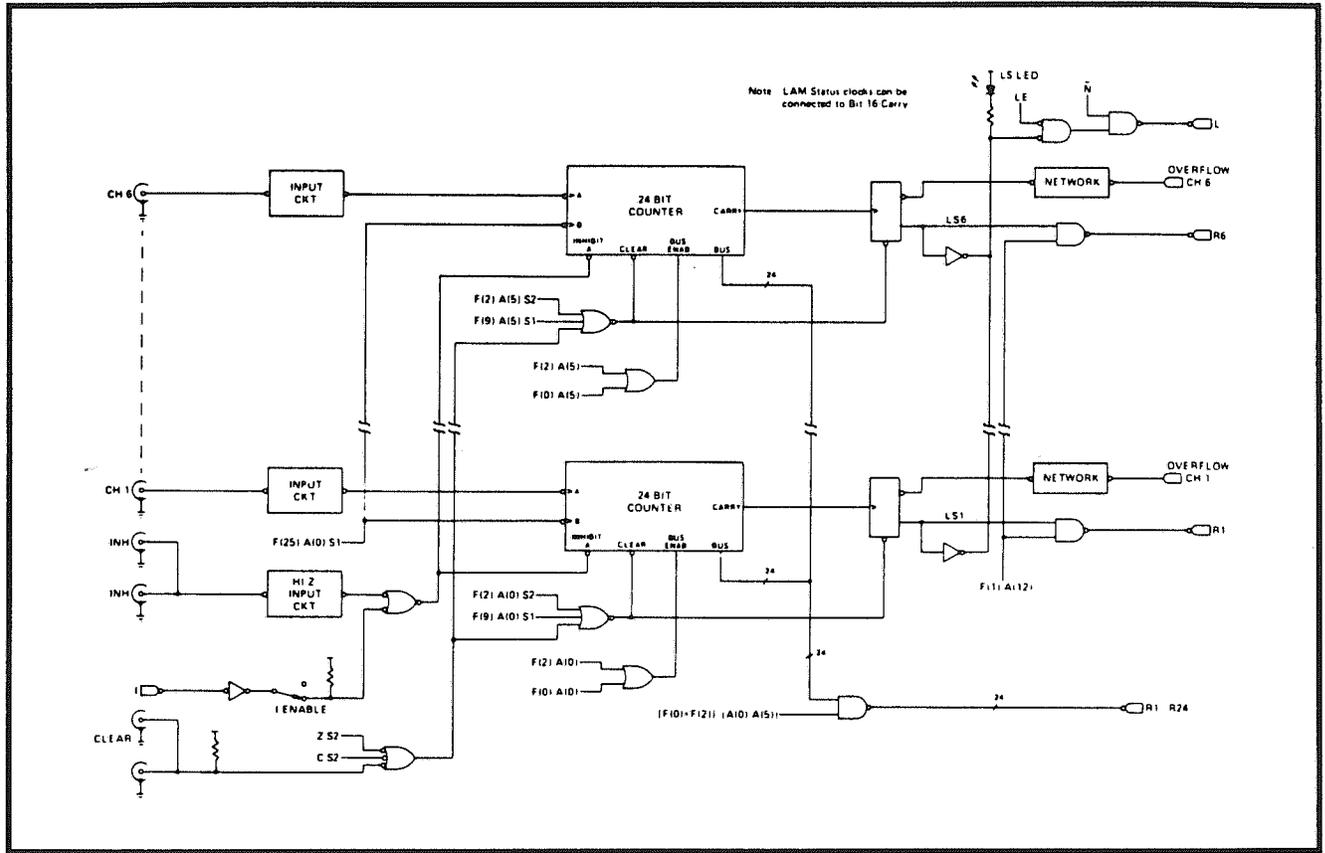
Power Requirements

+6 volts: 1200 mA

Ordering Information

Model 3615-L2A   100 MHz Counter, 6 channels, 24 bits, LEMO connectors

Related Products

Models 5910-Z1A, 5960-Z1A, or 5960-Z1B   Mating Connectors
Models 5857-Axyz and 5857-Bxyz   I/O Cables
Model 3655-L1A   Timing Pulse Generator, 8 channels, with LEMO connectors

FRONT PANEL DESCRIPTION

N   This LED flashes momentarily when the module is addressed.

LE   This LED is lit when the LAM request has been enabled by the $F(26) \cdot A(0)$ command.

LS   This LED is lit when any of the channels have set the LAM source by overflowing the counters.

CE   This LED is lit when the module is enabled to count. Either a Dataway Inhibit or an Inhibit signal from the front panel connector will disable the module from counting.

Inhibit
Switch   Dataway Inhibit enable/disable switch. In the up (EN) position, the Dataway Inhibit will disable counting when the Inhibit signal is true. In the down position, the Dataway signal will have no effect. This switch has no effect on the front panel inhibit signal.

Single Pin LEMO connectors:

0-5   These six LEMO connectors are the inputs to channels 0 through 5. Channel 0 is accessed through subaddress $A(0)$ for $F(0)$, $F(2)$, $F(9)$ and $F(10)$ function codes. Similarly, Channel 1 through Channel 5 will have subaddresses $A(1)$ through $A(5)$, respectively.

C   Two LEMO connectors for the external clear signal. The external clear signal is a low-true TTL level signal which clears all six counters and overflow bits. Two connectors are provided for 'daisy chaining'.

I   Two LEMO connectors used for inhibiting counting with a NIM level negative voltage. Two connectors are provided for 'daisy chaining'. A 50 ohm termination should be connected to the spare Inhibit input on the last 3615. These inhibit inputs are independent of the Dataway Inhibit switch.

INPUT SIGNAL DESCRIPTION

Channels 0-5 accept NIM standard signals at the front panel connector. These inputs are terminated in 50 ohms. A logical 1 occurs when an output is sinking 16 mA from the input. A logical 0 is represented by the output, that is driving the input, not sinking any current. In a logical 1 state the input (at the 50 ohm resistor) will be forced to -0.8 volts (50 ohms x (-16mA)) while a logical 0 will approximately be at ground potential. The input threshold of the module is approximately -0.4 volts.

MODULE STRAPS

Six straps, one for each channel, are provided for the user to select if the LAM status is set on the overflow of either 16 or 24 bits. These straps are located in the middle of the board with channel 0 at the bottom of the column and channel 5 at the top. Each channel is selected independently of the others. With the strap in location G, the LAM status will be set on the overflow of 24 bits, while location H is used for selecting 16 bit overflow.

For each of the channels, three straps are provided so the overflow output of one channel can pulse the input of another channel.

Loading strap A will connect the overflow bit to the 36-pin rear I/O edge connector. Moving this strap to location B will disconnect this signal from the edge connector.

Loading strap C will connect the overflow bit to the wire-or LAM source, while with the strap in location D, the overflow bit will be disconnected from this wire-or. When it is desirable to pulse the overflow bit (see below), the strap should be loaded in location D.

Strap location F is used to pulse the overflow bit. When the overflow bit gets set, from either a 16 or 24 bit carry, this strap feeds back the overflow bit through an R-C network to clear itself. Thus initiating a 200 nanosecond pulse. Strap E is loaded for normal operation of the 3615 when the LAM source is used.
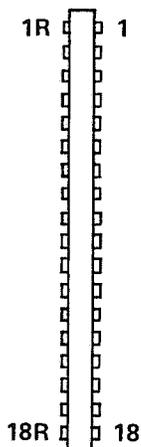
Summary: Load straps A, D, and F for each channel to output a pulse on an overflow.

Load straps B, C, and E for normal LAM status operation.

Refer to Figure 1 for strap locations.

Model 3615
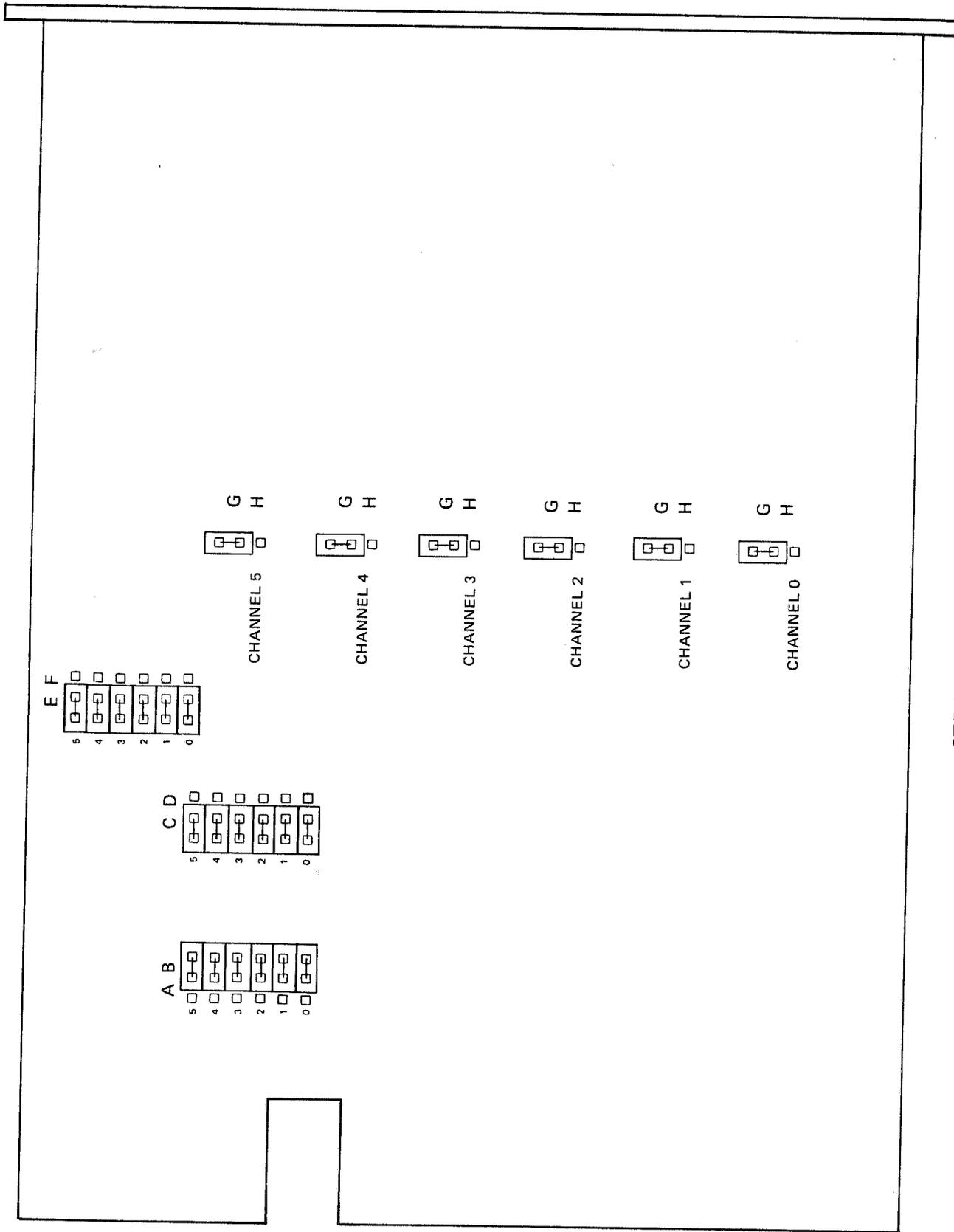
STRAP LOCATIONS
FIGURE 1

Model 3615

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1R □□ 1
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   □□
18R □□ 18
```

FACE VIEW

Pin/Wire List

18/36 POSTION P.C. EDGE

PIN NO.

1R	GND
2R	GND
3R	Channel 5 Overflow-NIM
4R	Channel 4 Overflow-NIM
5R	Channel 3 Overflow-NIM
6R	Channel 2 Overflow-NIM
7R	Channel 1 Overflow-NIM
8R	Channel 0 Overflow-NIM
9R	
10R	
11R	
12R	
13R	
14R	
15R	
16R	
17R	
18R	

PIN NO.

1	GND
2	GND
3	Channel 5 Overflow-TTL
4	Channel 4 Overflow-TTL
5	Channel 3 Overflow-TTL
6	Channel 2 Overflow-TTL
7	Channel 1 Overflow-TTL
8	Channel 0 Overflow-TTL
9	
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2. Obtain a Return Authorization (RA) Number.
3. Initiate a purchase order for the estimated repair charge if the product is out of warranty.
4. Include a description of the problem and your technical contact person with the product.
5. Ship the product prepaid with the RA Number marked on the outside of the package to:

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KineticSystems Company, LLC
Repair Service Center
900 North State Street
Lockport, IL 60441

Telephone: (815) 838-0005
Facsimile: (815) 838-4424
Email: tech-serv@kscorp.com

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