

**BLACK BOX CATALOGUE LIMITED**

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**BLACK BOX CATALOGUE LTD.  
USER GUIDE  
TB1014**

**MULTISPEED SME - X.21**

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## SME X.21 SYNC MODEM ELIMINATOR

### 1 GENERAL DESCRIPTION

The SME X.21 SYNC MODEM ELIMINATOR is referred to as the SME in this user guide.

This SME enables the direct connection of two synchronous devices having the CCITT X.21 (V11) interface. The SME has seventeen data speeds selectable by rear panel DIL switch. The data paths are completely symmetrical, so that data, clock and control signals are identical in both directions.

The two ports are presented on standard 15 way D type female connectors, named J1 and J2.

Each port has "TRANSMIT DATA", "RECEIVE DATA", "CLOCK", "CONTROL" and "INDICATE" signals at standard RS422 balanced voltage levels. These are all interfaced by industry standard RS422 line driver and receiver integrated circuits, so that maximum cable lengths are dependent on cable type and data speed.

The "CONTROL" signal on each port is fed back to the "INDICATE" signal on the same port, via an optional time delay. Alternatively the "INDICATE" signal may be held permanently in the active state.

The time delay between driving "CONTROL" active, and "INDICATE" going active may be set by a switch, to give a choice of 50 microseconds, 6 milliseconds or "INDICATE" held permanently active.

Four front panel push button switches permit selection of test modes independently for each direction of data. These test modes enable the data to be set to mark idle condition, or looped back, and the clock to be deleted.

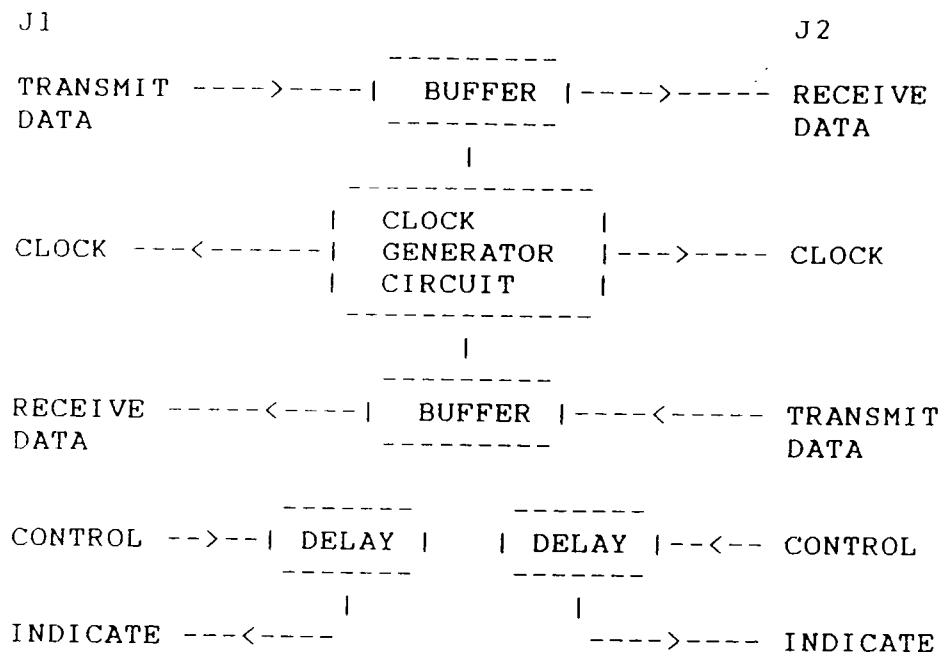
Front panel LEDs indicate "POWER ON" and "TEST MODE".

An LED marked "TEST" flashes if any of the test modes are selected, and acts as an easily observed warning of the unit being in a test mode.

A second LED marked "PWR" indicates that the unit is in the powered up condition.

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2 BLOCK DIAGRAM



PIN NUMBERING ON J1 AND J2

TRANSMIT DATA A ---> 2  
 TRANSMIT DATA B ---> 9  
 RECEIVE DATA A <--- 4  
 RECEIVE DATA B <--- 11  
 CLOCK A <--- 6  
 CLOCK B <--- 13  
 CONTROL A ---> 3  
 CONTROL B ---> 10  
 INDICATION A <--- 5  
 INDICATION B <--- 12  
 SIGNAL GROUND --- 8

CLOCK IS ALSO KNOWN AS SIGNAL TIMING



PIN LAYOUT ON J1 AND J2 AS VIEWED BY MATING CONNECTOR

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

o	o	o	o	o	o	o
15	14	13	12	11	10	9

---

3 OPERATION

- 3.1 Set the data speed to the value required by means of the DIL switch mounted at the rear panel.
- 3.2 Set the "CONTROL TO INDICATE" time delay to the required value by means of DIL switch mounted at the rear panel.
- 3.3 Connect the cables to the the two connectors J1 and J2.
- 3.4 Connect the plug mounted power supply module to the socket on the SME rear panel, and to a suitable mains supply.

\* \* \* IMPORTANT \* \* \*

Ensure that the mains supply is of the same voltage as that marked on the plug mounted power supply module.

- 3.5 Observe the LED marked "PWR" is on to indicate that the power supply module is connected and functioning correctly.
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4 SELECTION OF DATA SPEED

The data speed is selected by the rear panel DIL switch according to the table below.

SPEED	DIL SWITCH SETTING VIEWED THROUGH REAR PANEL					DIL SWITCH POLES 6,7 AND 8 DO NOT AFFECT DATA SPEED
	1	2	3	4	5	
64	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
128	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
192	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
256	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
320	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
384	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
448	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
512	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
576	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
640	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
704	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON
768	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF ON



SPEED	DIL SWITCH SETTING VIEWED THROUGH REAR PANEL					
Kbps	1	2	3	4	5	
832	o	o	o	o	o	OFF ON
896	o	o	o	o	o	OFF ON
960	o	o	o	o	o	OFF ON
1024	o	o	o	o	o	OFF ON
2048	o	o	o	o	o	OFF ON

## 5 SELECTION OF TEST MODES

The SME may be set to one of three test modes in each data direction.

This is achieved by the operation of four push button switches mounted on the front panel.

An LED marked "TEST" flashes if any of the test modes are selected, and acts as an easily observed warning of the unit being in a test mode.

### TEST SWITCH SETTINGS

-----TEST-----				TEST LED IS OFF
OUT	OUT	OUT	OUT	
1	2	3	4	

SME IN NORMAL OPERATION. THIS IS NOT A TEST MODE

-----TEST-----

TEST LED IS FLASHING

IN      OUT      OUT      OUT

1      2      3      4

J1 CLOCK IS NORMAL

J2 CLOCK IS NORMAL

J2 TRANSMIT DATA IS LOOPED BACK TO J2 RECEIVE DATA,  
AND SENT THROUGH TO J1 RECEIVE DATA.

J1 TRANSMIT DATA IS SENT NOWHERE

-----

-----TEST-----

TEST LED IS FLASHING

OUT    IN      OUT    OUT

1      2      3      4

J1 CLOCK IS NORMAL

J2 CLOCK IS NORMAL

J2 TRANSMIT DATA IS SENT THROUGH TO J1 RECEIVE DATA.

J2 RECEIVE DATA IS SET TO THE MARK IDLE CONDITION.

J1 TRANSMIT DATA IS SENT NOWHERE

-----

-----TEST-----

TEST LED IS FLASHING

IN IN OUT OUT

1 2 3 4

J1 CLOCK IS NORMAL

J2 CLOCK IS DELETED

J2 TRANSMIT DATA IS SENT THROUGH TO J1 RECEIVE DATA.

J2 RECEIVE DATA IS SET TO THE MARK IDLE CONDITION.

J1 TRANSMIT DATA IS SENT NOWHERE

-----

-----TEST-----

TEST LED IS FLASHING

OUT OUT IN OUT

1 2 3 4

J1 CLOCK IS NORMAL

J2 CLOCK IS NORMAL

J1 TRANSMIT DATA IS LOOPED BACK TO J1 RECEIVE DATA, AND  
SENT THROUGH TO J2 RECEIVE DATA

J2 TRANSMIT DATA IS SENT NOWHERE

-----



-----TEST-----

TEST LED IS FLASHING

OUT    OUT    OUT    IN

1       2       3       4

J2 CLOCK IS NORMAL

J2 CLOCK IS NORMAL

J1 TRANSMIT DATA IS SENT THROUGH TO J2 RECEIVE DATA.

J1 RECEIVE DATA IS SET TO THE MARK IDLE CONDITION.

-----

-----TEST-----

TEST LED IS FLASHING

OUT    OUT    IN       IN

1       2       3       4

J2 CLOCK IS NORMAL

J1 CLOCK IS DELETED

J1 TRANSMIT DATA IS CONNECTED THROUGH TO J2 RECEIVE DATA.

J1 RECEIVE DATA IS SET TO THE MARK IDLE CONDITION.

J2 TRANSMIT DATA IS SENT NOWHERE

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6 SELECTION OF "CONTROL" TO "INDICATE" DELAY

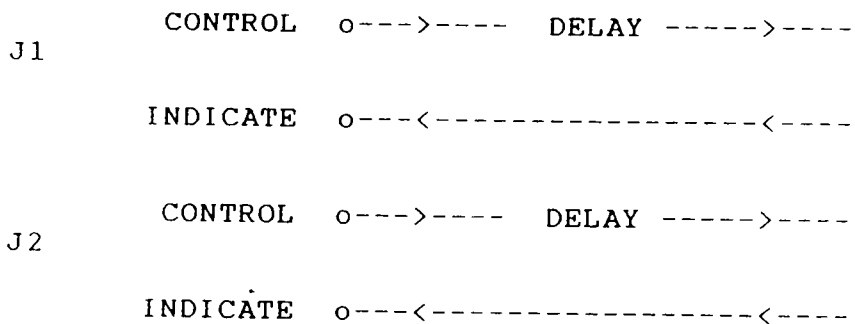
DIL SWITCH POLES 1, 2, 3, 4, AND 5 DO NOT AFFECT " CONTROL TO INDICATE " DELAY VALUE

DIL SWITCH SETTING VIEWED THROUGH REAR PANEL

	6	7	8	
	-----			
INDICATE IS HELD		o	o	OFF
PERMANENTLY ACTIVE	o			ON
	-----			
INDICATE WILL GO ACTIVE	o	o	o	OFF
50 MICROSECONDS AFTER				ON
CONTROL IS DRIVEN ACTIVE				
	-----			
INDICATE WILL GO ACTIVE	o		o	OFF
6 MILLISECONDS AFTER		o		ON
CONTROL IS DRIVEN ACTIVE				
	-----			

These time delays have a +/- 20% tolerance

These DIL switch settings affect connectors J1 and J2 identically.



9 SPECIFICATIONS

Weight: 1.3 kg

Dimensions: 130mm wide x 204mm deep x 60mm high

Mains supply: 240 VAC + - 10% 50 HZ 6 VA  
Other voltages available

Ambient Temperature: 0 to 40 degrees C

Relative humidity: 5 to 95 % non condensing

Connectors: Two DB15S female

Interface: X21 ( V11 )

Speeds: 64, 128, 192, 256, 320, 384, 448,  
512, 576, 640, 704, 768, 832, 896,  
960, 1024, 2048 Kbps.

Power supply module: Plug mounted. Conforms to BS6301  
and EN60950, and is BAPT approved.

All specifications are subject to change without notice.

