PHIL REES LITTLE 2M MIDI MERGE UNIT

The mighty **Little 2M** is a product of our unmatched MIDI merge design experience. It has two MIDI IN ports and one MIDI OUT port. The lower MIDI IN has a standard opto-isolated MIDI configuration, while power for the unit is derived via the upper MIDI IN port.

Powered from the line

The line-powered scheme is a significant convenience, as you won't need a battery or external adaptor. The **Little 2M** employs a novel power circuit which ensures very good compatibility, so it will work perfectly with the vast majority of MIDI master devices. A state-of-the-art low-power microcontroller provides a level of performance which was not previously possible in a line-powered unit.

An indicator lamp lights when correct power is being received. The same lamp dips to indicate transmit data flow, which makes sure that the lamp is consuming current when the MIDI output is not. To reassure the user that the system is running, the lamp flashes during dense data. It flashes rapidly when the only messages being sent are MIDI *Clocks* or *MIDI Time Code*.

The unit is compact (58mm x 69mm x 23mm).

Smart message handling

The **Little 2M** properly handles all MIDI message types. The **Little 2M** understands and generates *running status*.

System Exclusive messages of any length are retransmitted. *MIDI Time Code* quarter frame messages are only retransmitted when received on the upper IN port.

Our popular intelligent clock interlock system controls the retransmission of MIDI *Clocks*.

Applications
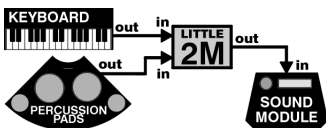
In the example above, two MIDI performance streams are rendered by a single sound module. The keyboard MIDI OUT port povides the source of power for **Little 2M**.

In the unlikely event that the keyboard MIDI OUT isn't compatible with the line-powered scheme, you can swap cables so that power is sourced from the percussion pads.
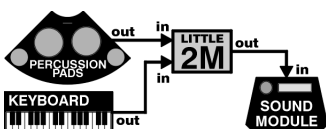
2M MIDI MERGE UNIT

The classic **2M** has a built-in mains power supply, so it is able to drive several outputs! There are thru outputs for each of the two MIDI inputs. The merged data is available simultaneously on two MIDI outputs, so you can drive two slave devices at the same time.

The smarter MIDI merge unit

The well-proven **2M** has a reputation for solid performance. It is widely acknowledged as offering the best MIDI merge function available anywhere. It recognises all MIDI data, including *MIDI Time Code* and *System Exclusive*, and has many automatic features to optimise performance and convenience.

The **2M** has ample RAM memory to accommodate multiple large data buffers and so minimise data loss. To mitigate undesirable delays, it could become necessary to reject some data. The **2M** does this gracefully and automatically according to a priority discard system; redundant data is thrown away first.

Clock interlock system


Clock interlock system state diagram
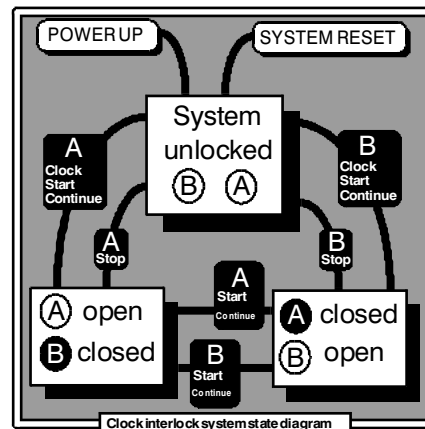
The MIDI *Clock* source is dynamically selected by our intelligent interlock system (see diagram above), which arranges that the most recently started clock stream takes over.

System Real Time messages (that includes the normal tempo-relative MIDI *Clocks*) and time sensitive *System Common* messages (including *MIDI Time Code* quarter frame messages, *Song Select* and *Song Position Pointer*) are kept in the right sequence and retransmitted at the first opportunity.

Merging MIDI data

A MIDI Merge Unit has applications wherever you need to combine two MIDI datastreams. You may want to send simultaneous performance to the MIDI IN port of a sequencer or multi-timbral sound module. You may want to run a computer patch editor to a synth module at the same time as playing the module from a keyboard. You may have to insert synchronisation (MIDI *Clocks* or *Time Code*) into a performance datastream.

Merging MIDI message streams

Sadly, you can't combine MIDI datastreams just by joining the wires together. Data that arrived at the same time would clash - and be corrupted into garbage. In addition, the 'bytes' of information must be organized so as to be in accord with the MIDI protocol. Merging MIDI datastreams is a job for a microprocessor-based system.
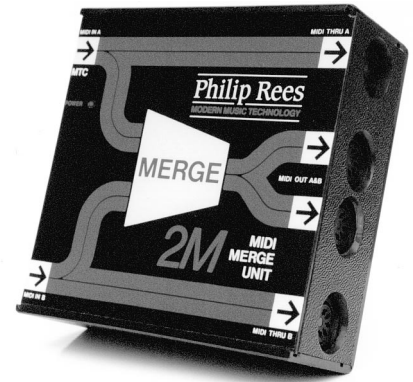
MIDI Time Code compatible

MIDI Time Code (MTC - that's not the same as MIDI clocks!) and the *Universal Real Time System Exclusive* messages are only accepted on MIDI IN A. The merging of two MTC streams would be pointless, and indeed two simultaneous sources of *Time Code* would be bizarre. You just connect a source of *Time Code* to input A if you want the code to be retransmitted, and to input B if you want the code to be discarded.

The presence of *MTC* on input A automatically inhibits the retransmission of *System Exclusive* messages received on input B.

System Exclusive

The **2M** is especially capable of making the most of interleaving *System Exclusive* transfers, and minimising the disruption of concurrent performance data. *System Exclusive* messages less than 140 bytes long (the majority) are inserted into a performance datastream. Appropriate action is taken, if necessary, to prevent stuck notes and pitchbend values when longer *SysEx* messages are to be retransmitted.

Pitchbend summing

Pitchbend values, relating to the same MIDI channel but coming from opposite inputs, are arithmetically combined. This is far better than allowing them to clash, which can give horrible results.

The **2M** understand and sends *Running Status*, so you get the benefits of more efficient communications and faster response. As it automatically inserts status bytes when it has the opportunity, problems with receiving devices that tend to lose current status are avoided.

Example application
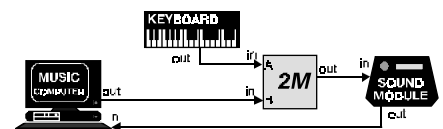
The above configuration shows one way of using a MIDI merge unit for on-line patch editing. The sound module has bi-directional communication with the computer and can also be played from the keyboard.

Neat package

The **2M** is 109mm x 109mm x 41mm. It contains a built-in mains power supply, oviating the need for an external adaptor. The integral mains lead comes with a plug.

3M MIDI MERGE UNIT

The **3M** follows in the fine tradition of our highly-respected **2M**, but the **3M** merges from three inputs in place of just two. The program inside this mains-powered unit has the extra fast, efficient code needed to successfully combine three simultaneous MIDI datastreams.

Comprehensive specification

When the data traffic is especially heavy, it may be necessary for the merge processor to reject some MIDI data, especially if undesirable delays are to be avoided. **3M** does this gracefully and automatically according to a priority discard system, redundant data being thrown away first. **3M** understands and sends 'running status'.

Time-critical System Common messages, including Time Code, are retransmitted at the first opportunity. Time Code and the associated Universal RT SysEx messages are only accepted on MIDI IN A.

The **3M** can handle System Exclusive messages of any length on any input.

Interlocks prevent conflicts

As on all our merge boxes, System Real Time messages are accepted on any input and are retransmitted as soon as possible. Clocks are managed by an intelligent interlock system.

Pitchbend messages, relating to the same MIDI channel, but coming from different inputs, are also controlled by an interlock system, to avoid conflicts and nasty noises.

Useful neat package

In the example installation in the diagram below, the sound module can render the combined commands of the synth, keyboard and sequencer. The sequencer can record the synth while it simultaneously plays the sounds on the sampler.
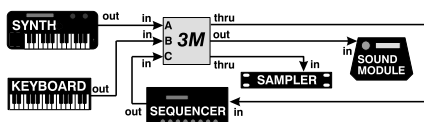

Like many of our products,The **3M** is exceptionally compact at only 109mm x 109mm x 40mm. This includes the built-in mains power supply (which obviates the need for an external adaptor) and the integral mains lead comes with a plug.

The useful **3M** has, of course, three MIDI inputs; it provides Thru outputs for two of these. The MIDI output of the merge processor is available on the third output socket.
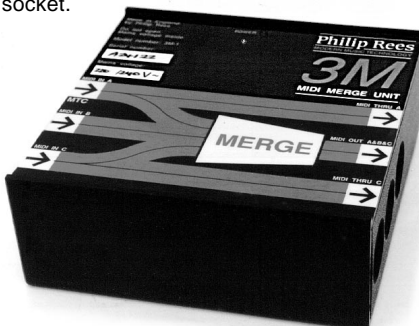
5M MIDI MERGE UNIT

When you need to drive a MIDI slave subsystem from up to five master devices at the same time, the **5M** will come to your rescue. It is a superb high-tech MIDI merge box which requires an external DC power source.
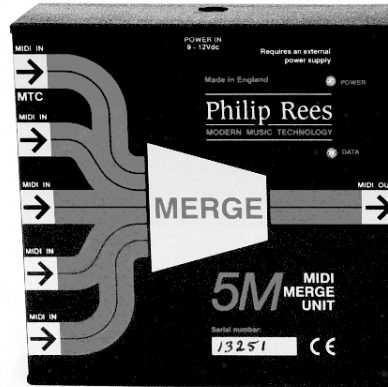

The comprehensive automatic features of the **5M** include intelligent interlocks on clocks and pitchbend. The embedded program employs an optimum combination of the message-stream and state-machine models of the MIDI merge function.

Merge applications

In the first example a **5M** combines five MIDI performances into one module.
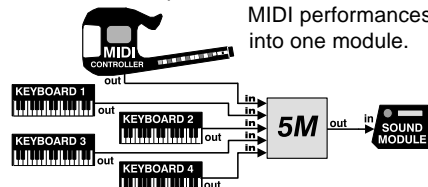
The **5M** could be put on the MIDI input to a computer, so that a performance could be recorded by a sequencer program. Other data could be received for filing or processing.
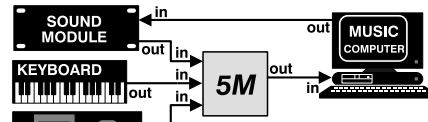
The above configuration could be used for allowing a sound editor program and a keyboard simultaneous access to a sound module, whilst keeping a return MIDI path to the computer.

The alternative configuration for on-line patch editing does not require the computer program to 'echo' the transmissions of a master keyboard or the MIDI controller.
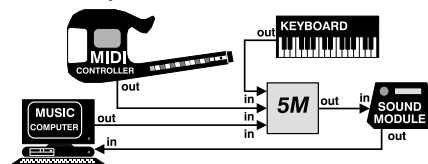

Fine five-input friend

The **5M** has five MIDI IN ports plus one MIDI OUT. There is a DATA LED which flashes to show that MIDI data is being transmitted. A POWER LED is also provided.

The **5M** requires an external dc power source of nine to twelve volts at 200mA, which is connected via a 3.5mm jack, tip positive. The sturdy ABS enclosure is just 109mm x 109mm x 40mm.

9M MIDI MERGE UNIT

The **9M** is a 9-into-1 DC-powered merge box, which will let the whole band play together via a single multi-timbral sound generator. It would also let a sequencer record many sources of MIDI data simultaneously and avoid the need to switch or re-cable.
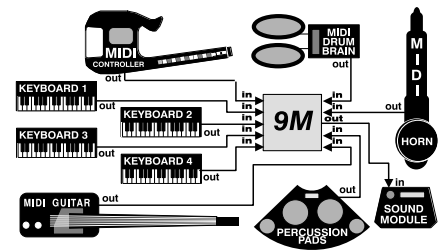
Sophisticated program

Philip Rees MIDI merge units have earnt a first class reputation. We have extended and refined the firmware techniques that made our smaller units so successful. This has made possible a really useful merge box design with a massive nine inputs.

The sophisticated data handling features of **9M** include our usual intelligent interlocks on clocks and pitchbend . Like the **5M**, the program employs a combination of the message-stream and state-machine methods, and it can readily handle all types of MIDI message including Time Code and SysEx. Like all our merge boxes, **9M** only accepts MIDI Time Code received on one specified input. This makes good sense.

High-performance hardware

These units must be able to deal with the large potential requirements of handling many data sources. Therefore, the **9M** and **5M** use a 24MHz processor and the same type of advanced asynchronous communication elements as the high performance serial interfaces on personal computers.

Convenient and compact

The **9M** has nine MIDI IN sockets and one MIDI OUT socket, which carries the output of the merge processor.

The **9M** requires an external dc power source of nine to twelve volts at 250mA, which is connected via a 3.5mm jack, tip positive. A POWER LED is fitted, which will light to indicate when the unit is powered up.

Despite its impressive capabilities, the unit is quite small and neat: the sturdy ABS enclosure is just 109mm x 109mm x 40mm.