LAVRY

SYNCHRONY-16

Model SYNC-16

Audio Master-Clock

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Caution

DO NOT OPEN THE Synchrony-16: Attempting to open the enclosure may result in damage to the unit. There are no user-serviceable parts inside.

There is a potential for speaker or hearing damage when digital audio equipment is not properly synchronized. It is also possible that audio will appear to pass normally while containing small glitches or clicks that are not immediately apparent. It is the responsibility of the end user to ensure all connections and settings are correct when using the Synchrony-16 as a master clock.

Any time a slave device is synchronized to the Sync-16, speakers should be muted before any changes are made to the Sync-16 settings.

If a Sync-16 word clock output is used, all slave devices must have **word clock** selected as their clock reference for proper operation. The user must confirm that each slave device is indicating "lock" to the Word Clock signal before assuming the system is properly synchronized and that audio will pass normally.

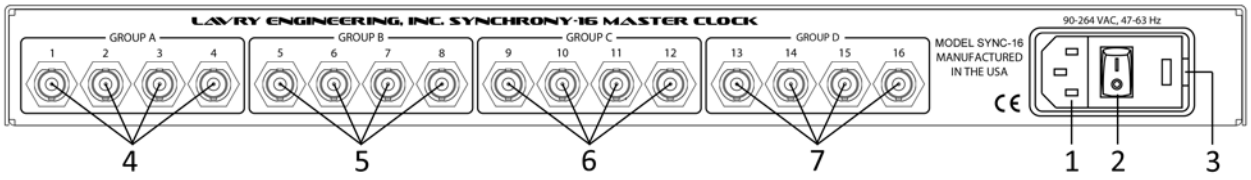
If a Sync-16 super clock output is used, the slave device must have **superclock** selected as its clock reference for proper operation.

Introduction

The Lavry Synchrony-16 is a master clock designed specifically to produce audio clock signals with remarkably low jitter, and to provide the highest quality clock signal to slave devices with proprietary BNC driver circuitry. With 12 word clock outputs and 4 super clock outputs, the need to split or chain outputs is eliminated for most users.

The Synchrony-16 has a simple user interface that consists of 6 control groups, and a termination diagnostic display. Each control group consists of a single button and either 2 or 3 LED status indicators.

Rear Panel



1. AC Power Connector	2. Power Switch
3. Fuse Access	4. Group A Word Clock Output Connectors
5. Group B Word Clock Output Connectors	6. Group C Word Clock Output Connectors
7. Group D Super Clock Output Connectors	

AC Power Connector

This unit accepts AC Power in the range of 93-264 Volts at 47-63 Hertz. Adjustment to AC power input in this range is automatic; there are no settings to change.

Power Switch

The power switch is a two position rocker switch.

Fuse Access

The Synchrony-16 fuses can be accessed from the rear panel. Please see the **Specifications** section for more details.

Group A Output Connectors

BNC Outputs 1 through 4 share a common **word clock** signal, selected from the front panel. The clock rates available range from 44.1kHz to 192kHz.

Group B Output Connectors

BNC Outputs 5 through 8 share a common **word clock** signal, selected from the front panel. The clock rates available range from 44.1kHz to 192kHz.

Group C Output Connectors

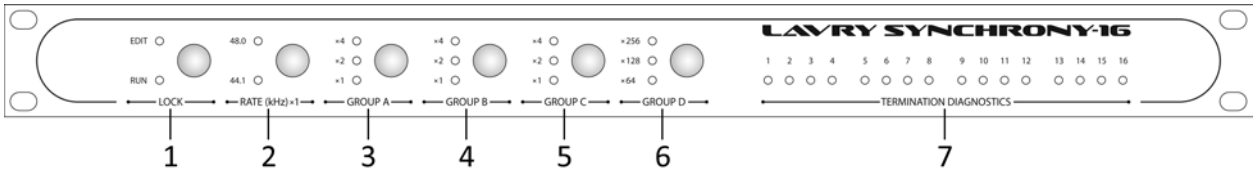
BNC Outputs 9 through 12 share a common **word clock** signal, selected from the front panel. The clock rates available range from 44.1kHz to 192kHz.

When using multiple Word Clock outputs, it is recommended they be connected in order starting with Group A. If more than 4 outputs are required connect them to Group B. If more than 8 outputs are required, use Groups A and B for AD and DA converters or interface units with analog inputs and outputs, and Group C for clocking of exclusively digital computer interfaces or digital processing units.

Group D Output Connectors

BNC Outputs 13 through 16 share a common **superclock** signal, selected from the front panel. The clock rates available range from 2.822h MHz to 12.288 MHz.

Front Panel



1. Control Lock	2. Base Clock Rate
3. Group A Clock Multiplier	4. Group B Clock Multiplier
5. Group C Clock Multiplier	6. Group D Clock Multiplier
7. Termination Diagnostics	

Control Lock

The ***Control Lock*** setting either enables or disables all other user controls on the Synchrony-16 front panel. The current state of this setting is indicated by the LEDs labeled "**Edit"** and "**Run"**. When the unit is in Run mode, all buttons except for the ***Control Lock*** button will cease to function, and the illumination of all LEDs will decrease in intensity.

It is highly recommended that Control Lock be set to **Run** at all times, unless settings are being changed.

Base Clock Rate

All sixteen outputs of the Synchrony-16 operate at multiples of a single base clock frequency of either 44.1kHz or 48kHz. The selected base rate is indicated by the two LEDs labeled "**44.1"** and "**48.0"**. This setting toggled via the ***Base Clock Rate*** button.

Clock Multiplier	Base Clock Rate = 44.1 kHz	Base Clock Rate = 48 kHz
1	44.1 kHz	48 kHz
2	88.2 kHz	96 kHz
4	176.4 kHz	192 kHz
64	2.8224 MHz	3.072 MHz
128	5.6448 MHz	6.144 MHz
256	11.2869 MHz	12.288 MHz

Table 1- Clock Rate Multiplication

Group A Clock Multiplier

Outputs 1 through 4 of the Synchrony-16 share a common signal. This signal is a frequency multiple of the ***Base Clock Rate***. The frequency multiplier for the group is indicated by the LEDs labeled "**×1"**, "**×2"**, and "**×4"** in the region denoted by "**GROUP A"**. This setting is controlled by via the adjacent button.

Group B Clock Multiplier

Outputs 5 through 8 of the Synchrony-16 share a common signal. This signal is a frequency multiple of the ***Base Clock Rate***. The frequency multiplier for the group is indicated by the LEDs labeled "**×1"**, "**×2"**, and "**×4"** in the region denoted by "**GROUP B"**. This setting is controlled via the adjacent button.

Group C Clock Multiplier

Outputs 9 through 12 of the Synchrony-16 share a common signal. This signal is a frequency multiple of the ***Base Clock Rate***. The frequency multiplier for the group is indicated by the LEDs labeled "**×1"**, "**×2"**, and "**×4"** in the region denoted by "**GROUP C"**. This setting is controlled via the adjacent button.

Group D Clock Multiplier

Outputs 13 through 16 of the Synchrony-16 share a common signal. This signal is a frequency multiple of the ***Base Clock Rate***. The frequency multiplier for the group is indicated by the LEDs labeled "**×64"**, "**×128"**, and "**×256"** in the region denoted by "**GROUP D"**. This setting is controlled via the adjacent button.

Termination Diagnostics

For each of the sixteen outputs of the Synchrony-16, there is one LED on the front panel which Illuminates when the output is properly terminated. Please see the BNC termination section for more information.

Do not attempt to operate slave devices unless the termination diagnostic LED is illuminated.

BNC Termination

Direct Termination

We suggest direct connection of one output on the Sync-16 to one Word Clock or super clock input on the slave device using a 75 Ohm BNC cable. If you do not know if the slave unit has internal termination, try the connection with only the BNC cable. If the Termination Diagnostic LED illuminates for that Sync-16 output, the slave unit has internal 75 Ohm termination.

If the diagnostic LED does not illuminate, determine if the slave unit has either a switch for the 75 Ohm termination or an internal jumper. It is recommended that the slave unit's termination be used whenever available.

If the slave unit does not have internal termination available, you must use a BNC "T" on the Word Clock input and place a 75 Ohm BNC terminator on the side of the T opposite the BNC cable.

Daisy Chain

With 12 Word Clock outputs available on the Sync-16, it should not be necessary to "Daisy Chain" Word Clock by connecting the Sync-16 to the Word Clock input of a slave device, and then the Word Clock output of the slave device to the Word Clock input of the next slave device. Doing so may introduce time delays in the Word Clock signal received by slave devices fed by other slave devices.

Split Termination

We do not recommend splitting or "mult'ing" a Word Clock signal (WC). Never split or mult a superclock signal.

There is only one way that a Word Clock signal can be split or mult'ed without serious degradation of signal quality. There can be only one device with 75 Ohm termination located physically at the end of the BNC "chain."

BNC "T" connectors are placed on the WC input of each slave device located between the Sync-16 output and the last slave device with 75 Ohm termination. Any devices located between the Sync-16 and the terminated device at the end of the chain *must not be terminated* (they must have high impedance inputs). The termination diagnostic indicator will not illuminate if there are multiple terminations in the chain.

Do not attempt to operate the slave digital audio devices in the chain unless the termination diagnostic indicator is illuminated.

Specifications

For detailed technical specifications, visit the following URL:
http://www.lavryengineering.com/products/sync-16.html

Output Signals

Output signals are TTL level when terminated with 75 Ohms.

Typical Rise time is 1.5 nanoseconds; Maximum Rise time is 2 nanoseconds. Rise time will vary with cable and load capacitance.

AC Power

The Sync-16 automatically adjusts to power input signals in the range of 90-264VAC, 47-63 Hz. No change of settings is necessary. Fuses are 500mA 250V Slow-Blow 5mm x 20mm.

> Always use fuses with the same value as those installed for replacement. Please check the Synchrony-16 manual available on our website to be certain you have the most current information.

Physical

Dimensions (including rear panel BNC connectors): 19”W × 1¾”H × 11½D (48.26 cm × 4.45 cm × 29.21 cm)

Shipping weight: 13lbs (6kg)

Limited Warranty – Lavry Sync-16

Subject to the conditions set forth below, for one year after the original purchase date of the product, Lavry Engineering will repair the product free of charge in the United States in the event of a defect in materials or workmanship.

Lavry Engineering may exchange new or rebuilt parts for defective parts. Please call the factory for an RMA number prior to shipment. No product will be accepted for warranty service without a pre-issued RMA number.

This warranty is extended only to an original purchaser of the product from Lavry Engineering, or an authorized reseller of Lavry Engineering. Products that are purchased from unauthorized resellers do not have any warranty coverage. A valid purchase receipt or other valid proof of purchase will be required before warranty service is provided. This warranty only covers failures due to defects in materials or workmanship and does not cover damages which occur in shipment or failures resulting from accident, misuse, line power surges, mishandling, maintenance, alterations and modifications of the product, or service by an unauthorized service center or personnel. Lavry Engineering reserves the right to deny warranty service to products that have been used in rental, service bureau, or similar businesses.

This limited warranty gives you specific legal rights. You may have others which vary from state/jurisdiction to state/jurisdiction.

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