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3.5 CC/8 kHz Output Module

3.5.1 Module Description

The CC/8 kHz Output Module is an optional output distribution module that provides a total of ten outputs. Eight of the outputs are balanced Composite Clocks, and two are differential 8 kHz outputs. Usually this module is paired with a second module. In that configuration, the outputs of each module tie together forming ten redundant pairs. Table 3.5-1 lists the Item Number for this module and Figure 3.5-1 shows the module's front panel.

Table 3.5-1: Module Item Numbers

ITEM NUMBER	DESCRIPTION
23412899-000-0	Module, CC/8 kHz Output

3.5.2 Indicators

Table 3.5-2 provides a description of the indicators on the panel of the CC/8kHz Output Module.

Table 3.5-2: Indicators, CC/8 kHz Output Module

INDICATOR	COLOR	DESCRIPTION
Power	Green	On = Module is receiving power Off = Module is not receiving power
Status	Green / Amber	Green = Module in normal operation Amber = Module has input or output failure
Source A	Green / Amber	Green = Input to module is present and selected Amber = Input to module is faulted Off = Input to module is not present, or not selected
Source B	Green / Amber	Green = Input to module is present and selected Amber = Input to module is faulted Off = Input to module is not present, or not selected

3.5.3 Functional Description

The following discussion refers to Figure 3.5-2 Block Diagram, CC/8 kHz Output Module.

The A and B –48 V Power are combined to supply power to the DC to DC converter that converts the input power to the required levels for powering the circuits.

This module accepts two clock source inputs, A or B, from separate Reference Controller Modules via the PRR-10 clock bus. The Source A or B indicator will be illuminated green indicating which clock source is selected and being used. In normal operation, the Status Indicator is illuminated green.

The module selects one of the clock sources (normally clock source A) and converts it to a 64 kbs AMI with a BPV every eight pulses, composite clock (CC) signal. An 8 kHz signal is also created. The CC signal couples to eight output ports through line interface drivers and transformers. Phase compensation for line lengths from 0 to 2,197 ns is user selectable in four increments: 0%, 33.3%, 66.6%, and 100%. The 8 kHz signal couples to two output ports through differential line drivers.

If clock source A fails, the module detects its loss and switches to clock source B. Source A indicator will be illuminated yellow and



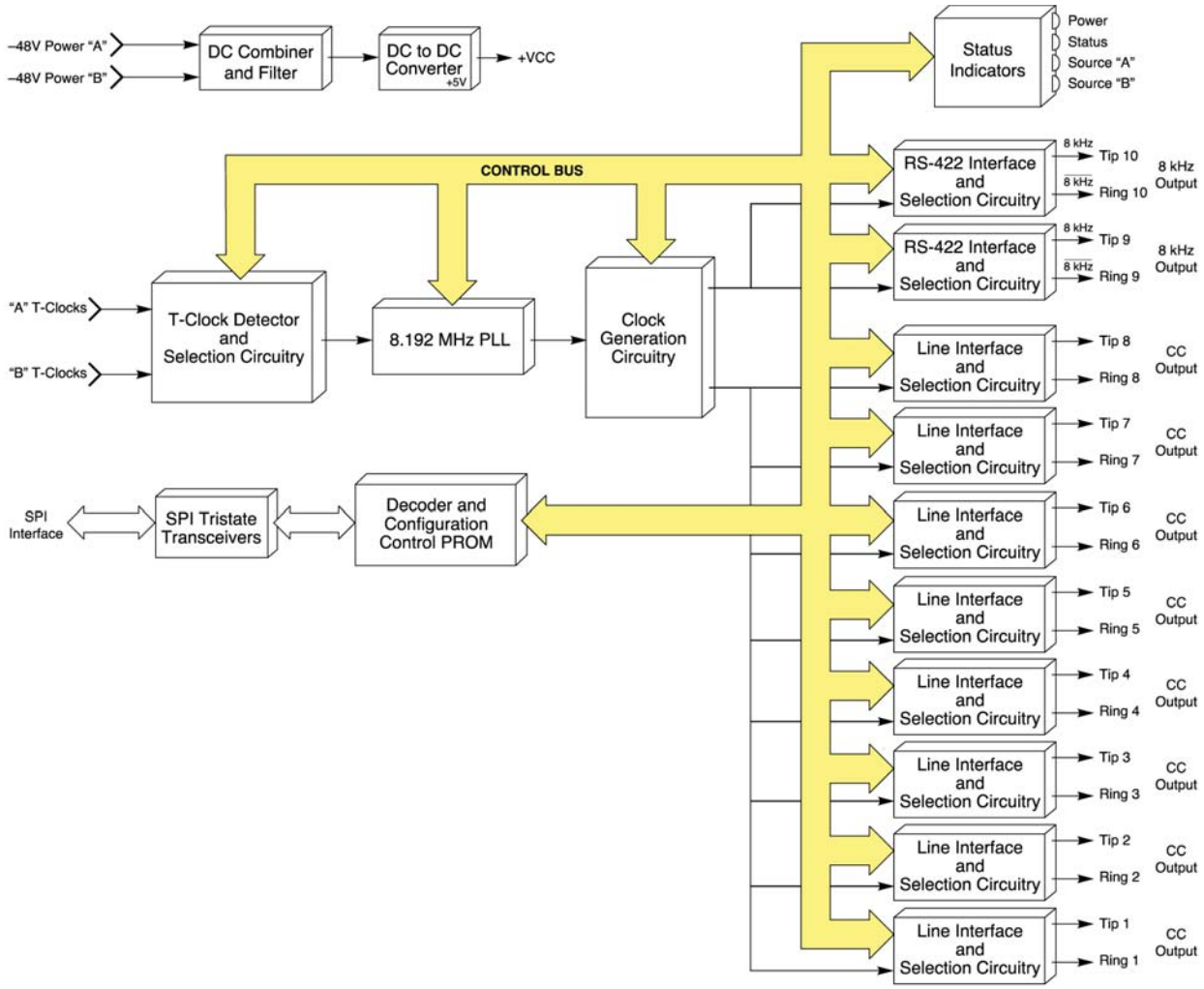
Figure 3.5-1: CC/8 kHz Output Module Front Panel

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Source B indicator will be illuminated green. The user may also select which clock source is to be used. The outputs are checked for signal presence. Should a clock source or output driver fail, the front panel Status Indicator will be illuminated yellow and the failure is reported to the Reference Controller Module.

Configuration control information for each module is stored at the factory in non-volatile memory on the card. This information is accessed via tristate transceivers and decoder circuitry using the Serial Peripheral Interface (SPI) bus by a Reference Controller Module. The user can request this information via one of the PRR-10 communications ports using the commands described in the Operation Section of this user guide.

Figure 3.5-2: Block Diagram, CC/8 kHz Output Module



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3.5.4 Specifications

Table 3.5-3 lists the specifications for the CC/8 kHz Output Module.

Table 3.5-3: Specifications, CC/8 kHz Output Module

CHARACTERISTIC	SPECIFICATION
DC Voltage	42 Vdc to –72 Vdc
Module Power @ 48 Vdc	< 9 watts, nominal
Serial Peripheral Interface	Data & Clock, EIA are RS-485 levels Address Lines are logic levels logic 0 = .5 V logic 1 = 4.5 V
Clock Bus	A/B T-pos, A/B T-neg & A/B T-clock, EIA RS-422 levels
Composite Clock (64 kb/s)	
Waveshape Rise Time Pulse Width Pulse Interval Duty Cycle	Rectangular (5/8 or 50/50 duty cycle), software selectable < 500 ns < 500 ns 9.8 µs ± 5% 9.8 µs ± 5% 15.6 µs ± 5% 7.8 µs ± 5% 62.5% 50.0%
Amplitude	2.7 to 5.5 V peak (3.5 V peak Nominal)
Phase Compensation	1/8 th UI, in 4 steps, approximately 0 to 2 µs
Drive Capability	0 to 1500 ft, 22 AWG ABAM cable
Termination Impedance	133 ohms ± 5%
8 kHz Output	
Format	Per EIA RS-422
Waveshape Rise Time Fall Time Duty Cycle	Squarewave < 50 ns < 50 ns 50/50 ± 10%
Amplitude	1.0 to 2.9 V peak, Differential
Termination Impedance	100 ohms ± 5%

3.5.5 Installation and Operation

The user can modify selectable parameters of the module via one of the PRR-10 communications ports using the commands described in the Operations Section of this user guide.

The Factory Default setting, unless otherwise specified, for all outputs:

Phase Comp 0% (0 ns)

3.5.5.1 Module Insertion

To install an output module in the PRR-10, insert it into the card guides located in the top and bottom of the shelf. Slide the module into the guides until it seats into the connector on the backplane. Tighten the captive screws located at the top and bottom of the module's panel.

Caution Be careful to completely insert the module into the slot and tighten the captive screws. A partially inserted module may be damaged or may not function properly.

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3.5.5.2 Connections

Verify that output signal connections to the corresponding output channel connectors have been done. These connectors contain tip, ring and sleeve connections, and are on the rear of the instrument. Refer to the Installations Section, Output Signals, for detailed instructions for connecting output signals.

3.5.5.3 Operational Check

1) After installing the module and with power applied to the instrument, verify the POWER indicator lights.
2) Verify the module is set up properly for the signals the signal outputs.
3) Verify the module is receiving the input signals by observing the indicators.
4) For normal operation, the indicators should be as follows with redundant Reference Controller Modules:.

INDICATOR	STATE
POWER	Green
STATUS	Green
SOURCE “A”	Green
SOURCE “B”	Off

Note Indicators may take a few seconds after module insertion to reach proper status.

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