

# 1166 Programming Guide

## Conventional Kiln Profiling Controller Programming Guide

To fully understand the following information, I highly recommend downloading a copy of the manual from the Partlow.com website and printing out the appropriate sections. The relevant pages are 18-24.

## 1166 Programming Manual

When locations are specified, the location in the 1166 Product Manual can be found by looking at the type across the bottom of each page. The type indicates the 'Section', the 'Page', and the 'Volume'. Where I would specify Volume I, Section 2, Page 3, it would be written in the manual as:

'2-3 Volume I' (or 'Volume 1 2-3', depending on which hand the page was located)

The 1166 is a fundamentally different controller than the standard 1160. The end user is strongly advised to become familiar with all aspects of their controllers. This worksheet is intended to be a supplemental guide to understanding the 1166. It is not intended to replace the supplied 1166 Product Manual.

One of the most new and radical ideas to grasp with when using the 1166 is the idea of lock codes and the altered menu structure.

Lock codes enable an operator to prevent the core 1166 settings from being casually tampered with. By default, the lock codes are 10 for both the controller setup and configuration modes of the 1166 (which are analogous to the tune and program modes of an 1160, respectively). By default, PC Specialties sets both lock codes to 0, which prevents a lock code from even needing to be entered. If an end user decides to use lock codes, they will need to be entered before changing modes.

The menu structure follows a format closer in nature to the older Partlow MRC-7000 devices as opposed to the more simplistic and streamlined Partlow 1160.

The pretune function built into the 1166 varies slightly from the function built into the 1160. Refer to Volume I, Section 1, Page 4.

When the 1166 is initially powered up, the display that the controller produces is referred to as the Base Mode. Refer to Volume I, Section 1, Pages 1-3.

### Configuration Mode

1. Refer to Volume II, Section 3, Pages 1-9 in the 1166 manual.
2. Cycle the power of the 1166. Wait for the power-on tests to complete.
3. Hold both the up arrow and the scroll keypads down until 'inPt' is displayed.

This is the Configuration Mode. The majority of the settings are preconfigured by PC Specialties. Options which are of the preference variety are left for the end user to specify.

One of the more important items here is 'tYPE', which specifies whether the programs (profiles) are of the 'rate' (rA) or the 'time' (ti) variety. Refer to Volume I, Section 2, Page 3 and Volume II, Section 3, Page 5. With 'rate' selected as the variable for 'tYPE', the programs are written using a ramp rate style segment. For a ramp segment, the ramp rate is specified, as well as the final setpoint value. Then, the controller ramps using the specified rate until the setpoint is reached. With 'time' selected, programs are written using a Partlow 7000 style segment. For a ramp segment, a final setpoint is specified, as well as the desired segment time. The, the controller ramps up to the final setpoint over the specified amount of time. PC Specialties has preconfigured the 'tYPE' to 'time'.

Pressing the up arrow and scroll keypads at the same time exits the configuration mode.

## Setup Mode

1. Refer to Volume I, Section 3, Pages 1-5.
2. After at least 30 seconds have passes since the 1166 was powered on, press the up arrow and scroll keypad together.
3. The display will cycle 'ProG', 'Cont' and 'End'. Pressing the scroll keypad with a given option displayed will choose that option. To choose Setup Mode, press the scroll keypad while 'Cont' is displayed.

The majority of the settings are preconfigured by PC Specialties.

Among the more important settings in the Controller Setup Mode is 'OFFS' (Process Variable Offset), analogous to Input Correction in an 1160, which allows small differences between the sensor reading and actual values inside of a kiln to be rectified. Process Variable Offset works in the same manner as Input Correction; a positive number entered as a value for 'OFFS' will be added to the process value displayed by the controller. A negative number will be subtracted from the process value.

Another important setting is the 'diFI' setting, also known as the ON/OFF Differential. This setting is analogous to the Hysteresis setting in an 1160. 'diFI' is a percent of the input span, so a value of 0.5 would set a hysteresis of .9 degrees around the setpoint  $((diFI/100) \times 180)$ .

For Wet Bulb controllers, the setting d\_A2 is analogous to the dAL2 setting in an 1160. This setting is used to adjust precisely where the output comes on for the spray alarm. This setting can be adjusted by the end user depending upon conditions in their kiln.

Also in the Controller Setup Mode, the Controller Setup Mode Lock Code can be specified, if the end user so decides.

Pressing the up arrow and the scroll keypad returns you to the 'ProG', 'Cont' and 'End' display. Pressing the scroll keypad with 'End' displayed will return you to the Base Mode.

## Program Mode

1. Refer to Volume I, Section 2, Pages 1-9
2. To enter the Program Mode, press the up arrow and scroll keypad together.
3. When 'Prog' is displayed, press the scroll keypad.

Unlike the layout and other sections of the 1166 Product Manual, the Program Definition Mode section is relatively clear and straightforward.

Depending upon how the end user chooses to enter programs (refer to the above section on 'tYPE'), the process varies slightly.

Rate type programs use a Partlow 1160 style of thinking. In these programs each segment has two parts, a rate portion and a setpoint portion. The rate is simply the amount of change per hour. If you enter 10.0 as the rate, your dry bulb or wet bulb will increase or decrease at a rate of 10°F per hour. If you enter 100°F as your setpoint in this segment, and your current dry bulb reading is 60°F, the controller will gradually allow the dry bulb to increase over the next four hours (10°F/hr, 100°F-60°F=40°F, 40°F/10°F=4hrs). If you enter 40.0 as the rate, and 140°F as the setpoint in the next segment, the controller will increase the temperature to 140°F over the next hour (40°F/hr, 140°F-100°F=40°F, 40°F/40°F=1hr).

"Time" type programs use an easier to understand style of thinking. In these programs, each segment also has two parts, a time portion and a setpoint portion. The time is the amount of time between whenever a segment starts and whenever you want the controller to reach the setpoint. So the initial segment of a schedule might have 4.0 entered as the time, and 100.0 entered as the setpoint. As in the above example, if you start at 60°F, this means the controller will gradually ramp up from 60°F to 100°F over the next four hours. It also means that if you start at 30°F, the controller will still ramp up to 100°F over the next four hours.

When you are entering your schedule, you should decide whether you want to use a conventional schedule that has immediate changes to setpoints (increasing the impact on your boiler) or if you want to utilize the 1166's ramping technology. If you just want to enter your current schedules with a minimum of fuss, then for each segment, enter a very high ramp rate (or short time). If you want to utilize ramp rates, you should decide which parts of your schedules can be altered to lessen the load on your boiler. The initial start up is the most likely candidate for this.

Pressing the up arrow and the scroll keypad returns you to the 'ProG', 'Cont' and 'End' display. Pressing the scroll keypad with 'End' displayed will return you to the Base Mode.

