BCS 6000C
DATA COLLECTION PACKAGE

⚠️ **WARNING**

These instructions are intended for use only by experienced, qualified combustion start-up personnel. Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

Table of Contents

These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.

⚠ **WARNING**

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

A. GENERAL INFORMATION

The Hauck Data Collection Package (DCP) is available as an option to the Hauck BCS6000C Burner Control System (BCS). Data is transmitted from the operator interface touchscreen of the BCS 6000C panel to the customer's PC via an RS232 cable. Software installed on the customer's PC logs data to a comma separated variable (csv) file. The csv file may be imported into analysis software, a database, or a spreadsheet such as Microsoft EXCEL. Data can then be analyzed locally or sent to a central location for analysis and processing.

B. RECEIVING AND INSPECTION

This option includes the following items:

302393   EZDAQ Software CD.

300262   Cable, touchscreen to PC connection.

300344   Module, 8-Pt Analog input (installed in slot 6 of the PLC rack).

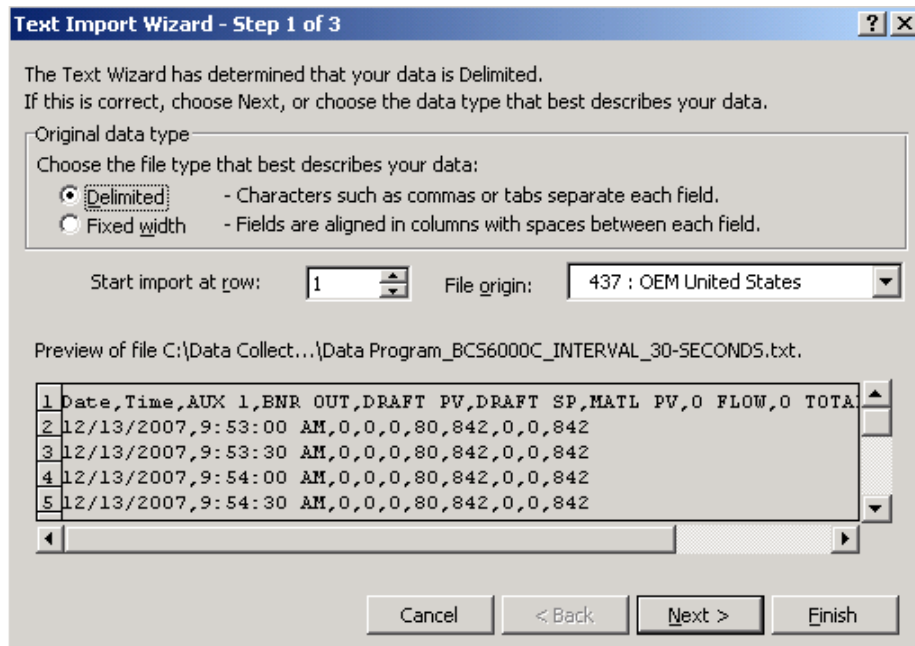402602X001 Pre-configured Hauck DCP Data Collection Program CD.

Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. Examine all parts to determine if there has been any damage in shipment. If equipment is to be stored prior to installation, provide a dry storage area.
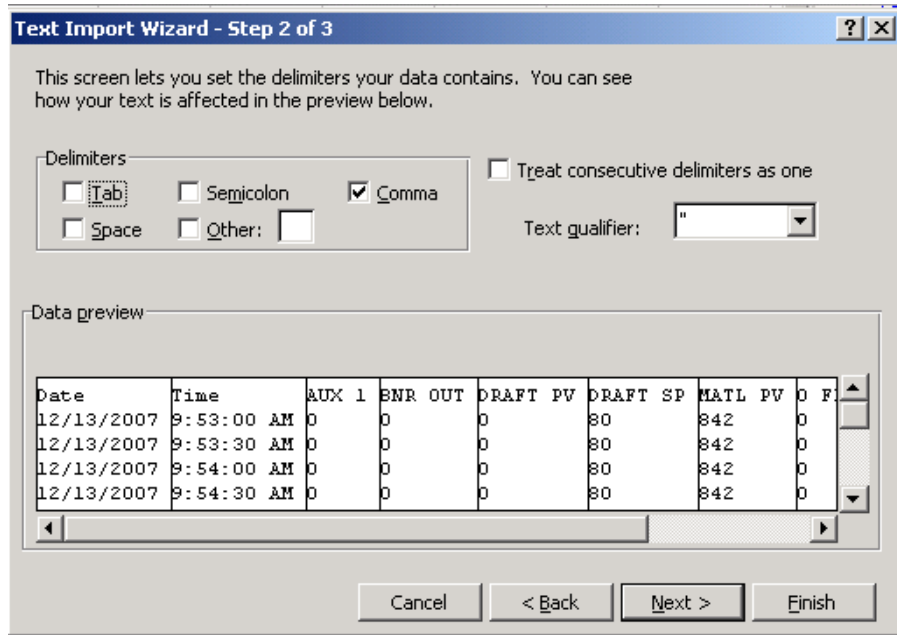
C. INSTALLATION

1.   EZDaq requires Microsoft .NET framework 1.1 (or later) to run. The .NET framework can be downloaded for free from Microsoft if it is not already present in your system.

2.   Microsoft EXCEL is required on the PC to view or printout the collected data.

3.   Insert the EZDaq CD into the PC's CD drive and follow the setup wizard instructions to install the software. Note: A copy of the EZDaq user's manual is also on the CD

4.   Create a new directory on your PC in **C:\Data Collection**

5.   Insert the Hauck Data Collection Program CD and copy the files named **Data Program** and **Format** into the **C:\Data Collection** directory.

6.   Install the serial cable between COM 1 port of the touchscreen and the COM port of your PC.

D.   OPERATION

1.   Reboot the PC to automatically launch the EZDAQ software and begin data collection. The software will create a csv file named **Data Program_BCS6000C_INTERVAL _3-MINUTE** in the **C:\Data Collection** directory.

2.   To import the data into an Excel file.

   a.   Open the Microsoft Excel file named **Format** in **C:\Data Collection**. The cells in this file have been preset for the proper number formats.

   b.   Select *File … Save as* and save the file with a new name i.e. "**2007-09-27 Data**"

   c.   Select *Data and Import External Data* then select *Import Data*. For Windows &, select *DATA* … *From Text.*

   d.   Browse to **C:\Data Collection** and select the **Data Program_BCS6000C_INTERVAL_3-MINUTES**.

   e.   Select *Delimited* and *Comma* as shown on the Text Import Wizard then click *Finish* to import the data into the workbook.

Text Import Wizard - Step 2 of 3   ? X

This screen lets you set the delimiters your data contains. You can see
how your text is affected in the preview below.

Delimiters
☐ Tab   ☐ Semicolon   ☑ Comma   ☐ Treat consecutive delimiters as one
☐ Space   ☐ Other: ☐   Text qualifier: ["] ▼

Data preview

Date	Time	AUX 1	BNR OUT	DRAFT PV	DRAFT SP	MATL PV	O F
12/13/2007	9:53:00 AM	0	0	0	80	842	0
12/13/2007	9:53:30 AM	0	0	0	80	842	0
12/13/2007	9:54:00 AM	0	0	0	80	842	0
12/13/2007	9:54:30 AM	0	0	0	80	842	0

Cancel   < Back   Next >   Finish

3.   Save the file to the PC or forward it to another location for analysis.

4.   The default COM port is COM 1. If this port is unavailable on your PC change the COM port as follows:

   a. Select the traffic light icon and stop the scheduler.

   b. Select *Panels … Edit* to display the **Edit Panel** Box.

   c. Select the appropriate COM port for your PC.

   d. Click *OK* when finished, <u>save your changes</u> and restart the scheduler.

5.   The default log interval is 3 minutes. To change the logging interval proceed as follows:

   e. Select the traffic light icon and stop the scheduler.

   f. Select *Panels … Edit* to display the **Edit Panel** Box.

   g. Left-click on the first scheduled tag to select it.

   h. Scroll down to the last scheduled tag then press *Ctrl + Shift* and left-click the last tag to select the entire list.

   i. Right-click In the Schedule column and select *Set schedule … Time based … Interval* and change the interval as desired.

   j. Click *OK* when finished, <u>save your changes</u> and restart the scheduler.

E.   LOGGED DATA:

Data collection points are listed in table 1. Detailed descriptions are given below.

No.	Parameter	Units	Input	Terminal
1	Temperature Setpoint	Degrees F or C	NA	NA
2	Stack Temperature	Degrees F or C	Slot 0 Input 2	NA
3	Material Temperature	Degrees F or C	Slot 0 Input 1	NA
4	Burner Output	Percent	NA	NA
5	Dryer Draft	Inches Water Column	Slot 0 Input 3	NA
6	Draft Setpoint	Inches Water Column	NA	NA
7	Auxiliary Input 2	Customer specified	Slot 0 Input 8	88
8	Gas Flow	SCFH	Slot 6 Input 1	96
9	Gas Usage	Cubic Feet	NA	NA
10	Auxiliary Input 1 Gas Pressure Compensation Or Other	Ounces or Customer specified	Slot 6 Input 3	95
11	Material Feed Rate	Tons per Hour	Slot 6 Input 2	97
12	Total Tons	Tons	NA	NA
13	BTU/Ton	BTU	NA	NA
14	Oil or LP Flow	Gallons per Minute	Slot 6 Input 4	98
15	Oil or LP Usage	Gallons	NA	NA
16	Auxiliary input 3	Customer specified	Slot 6 Input 5	101
17	Auxiliary input 4	Customer specified	Slot 6 Input 6	102
18	Auxiliary input 5	Customer specified	Slot 6 Input 7	103
19	Auxiliary input 6	Customer specified	Slot 6 Input 8	104

Table 1

Temperature Setpoint
> Either Material or Stack temperature may be selected for control. The setpoint of the selected control loop is logged.

Stack Temperature
> The temperature sensed by the thermocouple connected to the Stack high temperature limit instrument is retransmitted to the PLC via slot 0 input 2. Units may be configured as degrees F or C.

Material Temperature
> The temperature sensed by the thermocouple connected to the Material temperature instrument is retransmitted to the PLC via slot 0 input 1. Units may be configured as degrees F or C.

Burner Output
> The burner firing rate, 0.0 to 100.0% is logged.

Dryer Draft
> The BCS 6000C panel includes provisions for dryer draft control. An optional draft transmitter, 401801X_ _ _ is required. Units are display as inches of water column, "WC.

Draft Setpoint
> The draft setpoint in "WC is also logged.

Auxiliary Input 2

Slot 0, Input 8 (terminal 88) may be used for an auxiliary analog input. The module in slot 0 is a 0 to 5Vdc; therefore, a 250 Ohm resistor is installed between terminals 88 and 81 to enable the use of a 4-20mA signal. See Appendix B for special instructions regarding this input.

Gas Flow

Slot 6, Input 1 is pre-assigned for gas flow measurement. A differential pressure transmitter with a 4-20mA square root output, 401801X_ _ _ is required. The transmitter is installed across the orifice plate in the gas supply line. Gas flow is displayed and logged in Standard Cubic Feet per Hour, SCFH. Determine the range of the differential pressure transmitter required to measure the maximum gas input through the gas orifice meter. Use Hauck ESolutions to determine the 20mA flow value at 2 psi supply pressure. Pressure compensation for the gas flow input may be automatic or manual. Automatic pressure compensation may be selected for Auxiliary input 1. Alternatively, manual pressure compensation is based on an input box on the BCS 6000 Motor Calibration and Setup Screen. Note: 2 psi is used as the basis for either automatic or manual pressure compensation.

Gas Usage

Totalized Gas Usage is also logged. Totalized values may be reset by pressing the Reset button on the Data Collection screen.

Auxiliary Input 1

Slot 6, Input 3 may be used to provide automatic pressure compensation for the gas flow measurement. A pressure transmitter with a 4-20mA output, 404830X_ _ _ is required. The transmitter is installed upstream of the gas orifice plate. Gas pressure is displayed and logged in Ounces, OZ. If not selected for gas pressure compensation, auxiliary input 1 may be used for a customer specified 4-20mA input.

Material Feed Rate

Slot 6, Input 2 is pre-assigned for material feed rate input. A signal conditioner, 302394, is required to isolate the customer's feed rate transmitter signal from the BCS 6000 signals. Selecting this option brings up input boxes for Gas BTU per Cubic Foot and OIL/LP BTU per Gallon. The system will then be able to log Tons/Hour, Total Tons, and BTU/Ton.

OIL/LP Flow

Slot 6, Input 4 is pre-assigned for Oil or LP flow measurement. A flow transmitter with a linear 4-20mA output is required. Oil/LP flow is displayed and logged in Gallons per Minute, GPM.

Oil Usage

Totalized Oil Usage is also logged. Totalized values may be reset by pressing the Reset button on the Data Collection screen.

Auxiliary Inputs 3 through 6

Slot 6, Inputs 5, 6, 7, and 8 may be used for any customer defined inputs. A signal conditioner, 302394, is required to convert the customer's input to a linear 4-20mA signal isolated from the BCS 6000 signals. The isolator is configured via dip switches to accept any of the following inputs:

    0 to 20mA
    4 to 20mA
    0 to 5Vdc
    0 to 10Vdc
    0 to 10Hz
    0 to 100Hz

Alternatively, thermocouple transmitters, 401797X001, may be used if additional temperature inputs are desired.

302394 SIGNAL CONDITIONER WIRING

All customer supplied signals must use a signal conditioner to isolate them from the operating signals of the BCS 6000C control system.
> Connect the incoming signal to the appropriate terminals for current (1) or voltage (2).
> Connect the reference of the incoming signal to 0V (3).
> Connect +24V (7) to terminal 99 of the BCS 6000 control panel.
> Connect 4-20mA (9) to the input terminal of the BCS 6000 panel

401797X___ THERMOCOUPLE TRANSMITTER WIRING

> Connect the incoming signal to the appropriate thermocouple terminals. 1 = (-), 2 = (+).
> Connect output (+) to terminal 99 of the BCS 6000 control panel.
> Connect output (-) to the input terminal of the BCS 6000 panel

APPENDIX A: DATA POINT CONFIGURATION

Please provide the following information to enable pre-configuration of the data collection points for your system.

PC communication port: COM _____

Data File Location: Default = **C:\Data Collection** or Other : _____

Gas BTU per Cubic Foot: _____

Oil [   ] or LP [   ] BTU per Gallon: _____

Complete the following table to define the inputs you wish to log.

1. Place an **X** in the **Select** column for each input you will be using. **Note**: for parameter 9 select either **Gas Pressure Compensation** or **Other**.

2. Fill in a **Name** (maximum 18 characters) (i.e. EXHAUST FAN AMPS, VISCOSITY, etc.

3. Enter the value represented by a **4mA** input (typically 0).

4. Enter the value represented by a **20mA** input (i.e. 500 TPH, 60 Ounces, etc.).

   Note: For gas flow, determine the range of the differential pressure transmitter required to measure the maximum gas input through the gas orifice meter. Use Hauck ESolutions to determine the 20mA flow value at 2 psi supply pressure. Pressure compensation for the gas flow input may be automatic or manual. Automatic pressure compensation may be selected for **Auxiliary input 1**. Alternatively, manual pressure compensation is based on an input box on the BCS 6000 Motor Calibration and Setup Screen. Note: 2 psi is used as the basis for either automatic or manual pressure compensation.

5. Enter the desired **Units** (maximum 4 characters) for each point.

Parameter	Log	Name	4mA	20mA	Units	Tag	Term
Temp Setpoint	X	Temp Setpoint	NA	NA	F or C	TEMP SP	NA
Stack Temp	X	Stack Temp	NA	NA	F or C	STACK PV	NA
Material Temp	X	Material Temp	NA	NA	F or C	MATL PV	NA
Burner Output	X	Burner Output	NA	NA	%	BNR OUT	NA
Dryer Draft	X	Draft			"WC	DRAFT PV	94
Draft Setpoint	X	Draft Setpt	NA	NA	"WC	DRAFT SP	NA
Auxiliary Input 2 0-5Vdc –OR--	X					AUX 2	88
Auxiliary Input 2 4-20mA	X					AUX 2	88
Gas Flow		Gas Flow			SCFH	G FLOW	96
Gas Usage	*	Gas Usage	NA	NA	CF	G TOTAL	NA
Auxiliary Input 1 Gas Pressure Or Other	____	Gas Pressure			OZ	AUX 1	95
Tons per Hour		Tons/Hour			TPH	TPH	97
Total Tons	**	Total Tons	NA	NA	TONS	T TOTAL	NA
BTU per Ton	**	BTU/Ton	NA	NA	BTU	BTU/TON	NA
Oil Flow		Oil Flow			GPM	O FLOW	98
Oil Usage	*	Oil Usage	NA	NA	GAL	O TOTAL	NA
Auxiliary Input 3						AUX 3	101
Auxiliary Input 4						AUX 4	102
Auxiliary Input 5						AUX 5	103
Auxiliary Input 6						AUX 6	104

* Automatically logged when flow is selected
** Automatically logged when TPH is selected

APPENDIX B: AUXILIARY INPUT 2

The following special instructions are provided for Auxiliary input 2, the spare 0-5Vdc analog input in slot 0:

Hardware:

Temperature inputs will require the use of a thermocouple transmitter. Hauck part number 401797X001 is configured for a type J thermocouple with a range of 32 to 842°F. Consult the factory for other thermocouple types or ranges.

Interaction between power sources and/or supplies can interfere with the analog signals of the BCS 6000 control system. Therefore, a Signal Isolator (Hauck part number 302394) should be used for any input signal that is not powered by the BCS 6000 panel. The isolator may be configured via dip switches to accept any of the following inputs:

> 0 to 20mA
> 4 to 20mA
> 0 to 5Vdc
> 0 to 10Vdc
> 0 to 10Hz
> 0 to 100Hz

Setup:

1. Access the configuration screen. Password = 2701940

2. Press the AUX IN button to change it from OFF to ON.

3. Press the TYPE button if necessary to toggle between 4-20mA and 0-5 Vdc.

4. Press the NAME FOR AUXILIARY INPUT box and enter a name for the auxiliary input (maximum 14 characters).

5. Press the UNITS box and enter the desired units (Maximum 4 characters).

6. Press the ZERO box and enter the value represented by 4 mA or 0 Vdc.

7. Press the SPAN box and enter the value represented by 20 mA or 5 Vdc.

Examples:
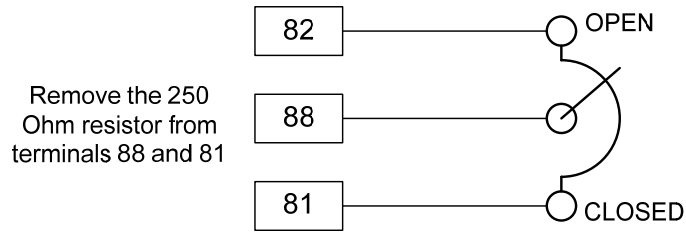Figures 1 through 4 on the following page illustrate wiring configuration for various inputs.

82 ——————O OPEN

Remove the 250
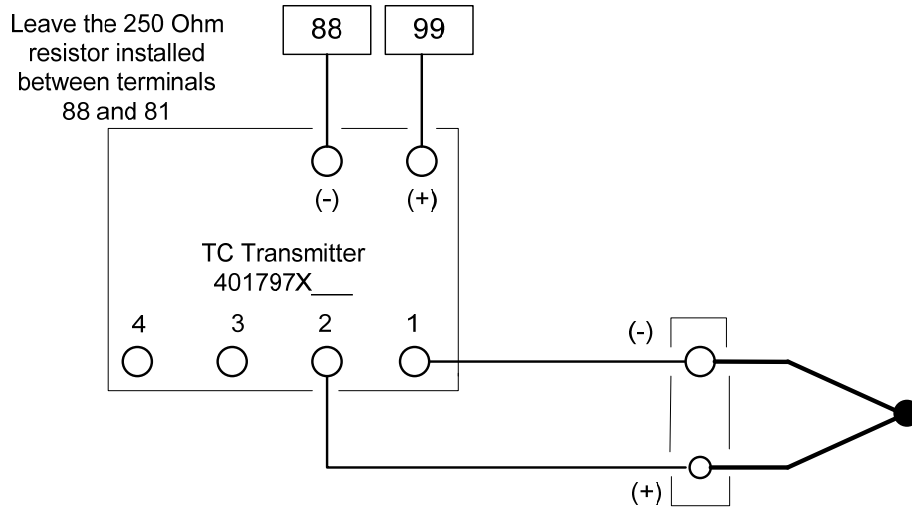Ohm resistor from
terminals 88 and 81

88 ——————O

81 ——————O CLOSED

Figure 1: Potentiometer

Leave the 250 Ohm
resistor installed
between terminals
88 and 81

88   99

(-)   (+)

TC Transmitter
401797X___

4   3   2   1

(-)

(+)

Figure 2: Thermocouple

Leave the 250 Ohm
resistor installed
between terminals
88 and 81

99 ——————O (+)

Transmitter

88 ——————O (-)

Figure 3: 2-Wire Transmitter

99 ——————O 7   1 O◄——— Customer's 0/4-20mA input

-OR-

88 ——————O 9   2 O◄——— Customer's 0-5/10 Vdc input

Leave the 250 Ohm
resistor installed
between terminals
88 and 81

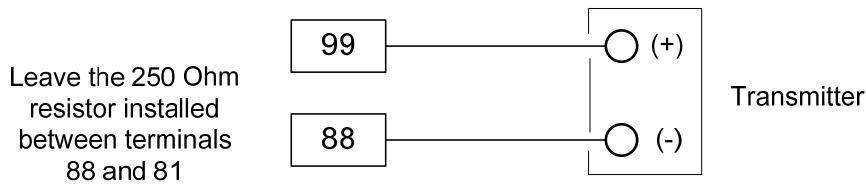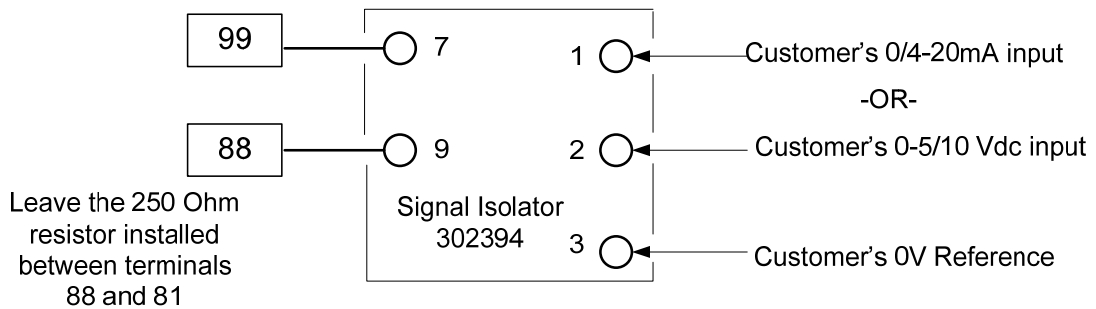Signal Isolator
302394   3 O◄——— Customer's 0V Reference

Figure 4: Signal Isolator

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