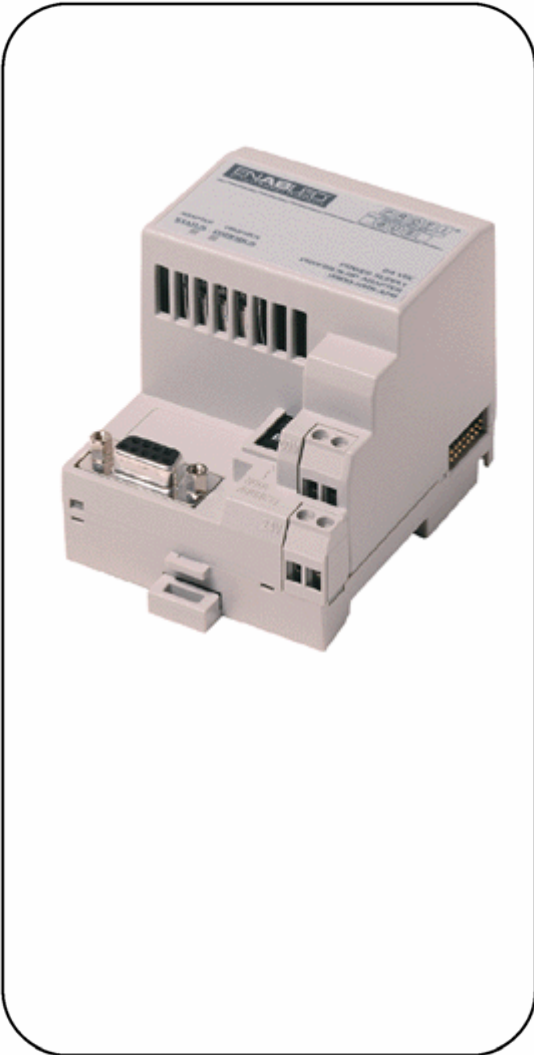


# inRAx



## 3170-PDP

FLEX Platform  
FLEX I/O™ PROFIBUS Adapter

## User Manual

August 23, 2007

  
**ProSoft**  
TECHNOLOGY

# Please Read This Notice

Successful application of this module requires a reasonable working knowledge of the Rockwell Automation hardware, the 3170-PDP Module and the application in which the combination is to be used. For this reason, it is important that those responsible for implementation satisfy themselves that the combination will meet the needs of the application without exposing personnel or equipment to unsafe or inappropriate working conditions.

This manual is provided to assist the user. Every attempt has been made to assure that the information provided is accurate and a true reflection of the product's installation requirements. In order to assure a complete understanding of the operation of the product, the user should read all applicable Rockwell Automation documentation on the operation of the Rockwell Automation hardware.

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---

Attentions help you:

- identify a hazard
- avoid the hazard
- recognize the consequences

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3170-PDP User Manual

August 23, 2007

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# 1 About this User Manual

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## 1.1 Purpose

Use this manual to install and configure your FLEX I/O™ PROFIBUS Adapter, cat. no. 3170-PDP.

## 1.2 Vocabulary

In this manual, we refer to:

- the FLEX I/O PROFIBUS adapter module as the "adapter"
- the programmable controller as the "processor"

## 1.3 Publication references

All publications this document refers to are Rockwell Automation publications.

## 1.4 Related Publications

For additional information on planning and installing your PROFIBUS system using FLEX I/O modules, refer to the following publications:

Catalog Number	Description	Related Publications	
		Pub. Type	Pub. Number
3170-PDP	24V dc PROFIBUS Adapter	Installation Instructions	801.09
1794-TB2	2-wire Terminal Base	Installation Instructions	1794-5.2
1794-TB3	3-wire Terminal Base		
1794-TBN	Terminal Base Unit	Installation Instructions	1794-5.16
1794-TBNF	Fused Terminal Base Unit	Installation Instructions	1794-5.17
1794-PS1	Power Supply	Installation Instructions	1794-5.35
1794-IB16	24V dc 16 Input Module	Installation Instructions	1794-5.4

Catalog Number	Description	Related Publications	
		Pub. Type	Pub. Number
1794-OB16	24V dc 16 Output Module	Installation Instructions	1794-5.3
1794-IR8	24V dc RTD Analog 8 Input Module	Installation Instructions	1794-5.22
		User Manual	1794-6.5.4
1794-IT8	24V dc Thermocouple Analog 8 Input Module	Installation Instructions	1794-5.21
		User Manual	1794-6.5.7
1794-IE8	24V dc Selectable Analog 8 Input Module	Installation Instructions	1794-5.6
		User Manual	1794-6.5.2
1794-OE4	24V dc Selectable Analog 4 Output Module	Installation Instructions	1794-5.5
		User Manual	1794-6.5.2
1794-IE4XOE2	24V dc 4 Input/2 Output Analog Combo Module	Installation Instructions	1794-5.15
		User Manual	1794-6.5.2
1794-IB8S	24V dc Sensor Input Module	Installation Instructions	1794-5.7
1794-IA8	120V ac 8 Input Module	Installation Instructions	1794-5.9
1794-OA8	120V ac 8 Output Module	Installation Instructions	1794-5.10
1794-OW8	24V dc 8 Relay Output Module	Installation Instructions	1794-5.19
1794-CE1	Extender Cable	Installation Instructions	1794-5.12
1794-NM1	Mounting Kit	Installation Instructions	1794-5.13

To order these publications, contact your local Rockwell Automation representative.

## 1.5 Compliance to European Union Directives

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

### 1.5.1 EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

## 2 Overview of FLEX I/O and Your PROFIBUS Adapter Module

### *In This Chapter*

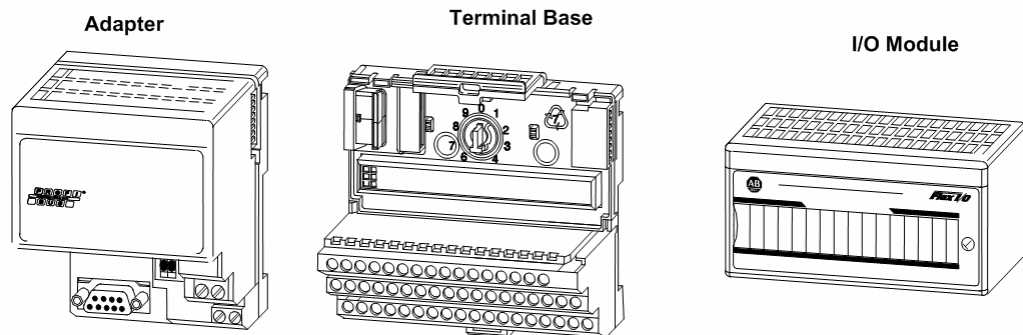
- The FLEX I/O System ..... 11
- Mount and Remove your System Easily ..... 12
- Optional Accessories ..... 13
- Purpose of the 3170-PDP ..... 16
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This chapter describes

- what the FLEX I/O system is and what it contains
- how to mount and remove your system easily
- optional accessories
- mounting dimensions and spacing requirements
- 3170-PDP
- adapter components
- how to connect power wiring

### 2.1 The FLEX I/O System

FLEX I/O is a small, modular I/O system for distributed applications that performs all of the functions of rack-based I/O. The FLEX I/O system contains the following components:



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- PROFIBUS adapter/power supply - powers the internal logic for as many as eight I/O modules

- terminal base - contains a terminal strip to terminate wiring for two- or three-wire devices
- I/O module - contains the bus interface and circuitry needed to perform specific functions related to your application

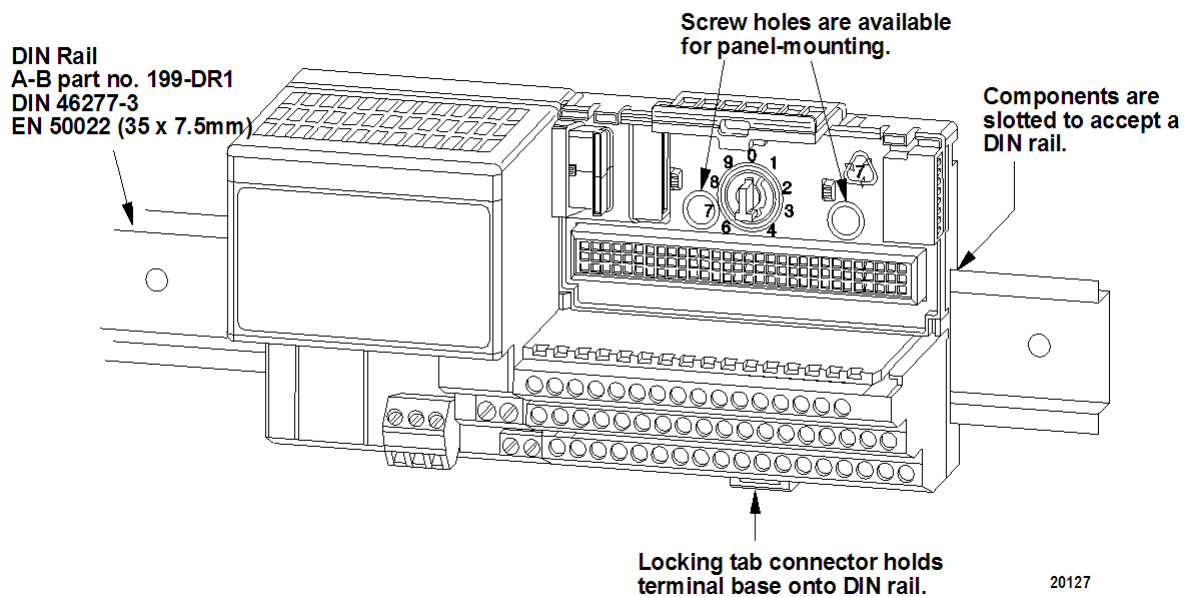
For information on how communication occurs over the FLEX I/O system backplane, refer to Chapter 2.

You can horizontally or vertically mount the FLEX I/O system on a standard DIN rail. The adapter and terminal base easily snap on the DIN rail by hand. Refer to the installation instructions shipped with these components.

## 2.2 Mount and Remove your System Easily

Screw holes are also provided to horizontally or vertically panel-mount your system in an enclosure. To panel-mount your FLEX I/O system, use the optional mounting kit (1794-NM1).

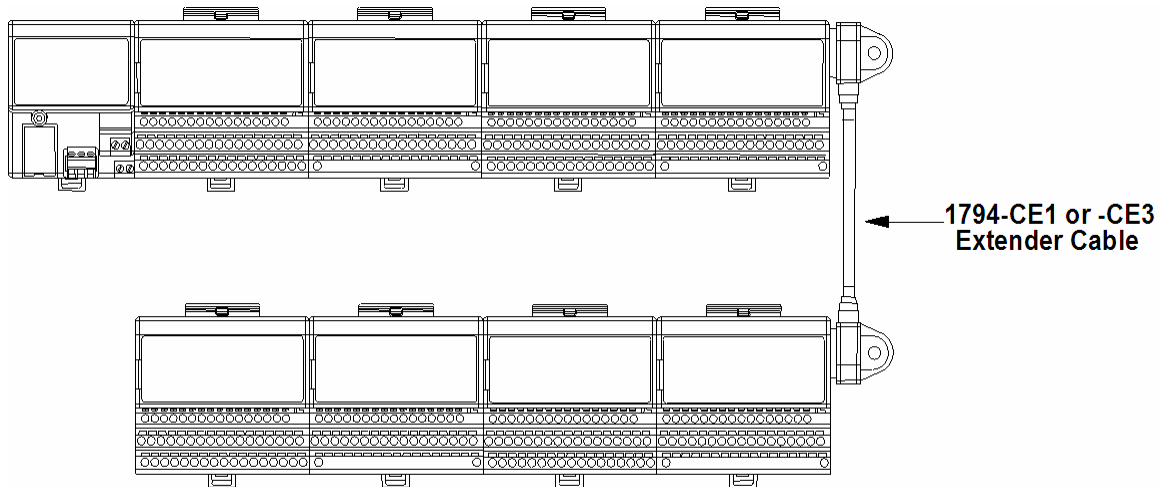
An example of a DIN-rail mounted system is shown below.



## 2.3 Optional Accessories

### 2.3.1 Extender Cables (1794-CE1 or -CE3)

Use the optional 1794-CE1 (0.3m) or -CE3 (0.9m) extender cable (one per system) to arrange your system in two rows or split your system into horizontal and vertical orientation.



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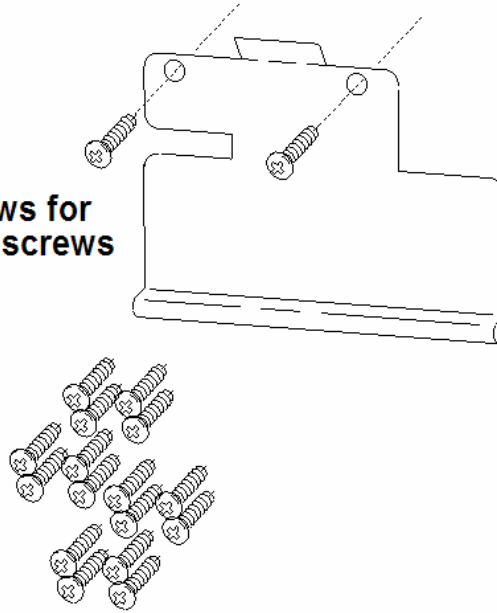


**ATTENTION:** This cable can only be used between I/O modules. Do not use between the adapter and I/O modules. Do not use more than one cable per system.

### 2.3.2 Mounting Kit (1794-NM1)

Use the optional 1794-NM1 mounting kit to mount your system on a panel or wall without a DIN rail.

**1794-NM1  
Mounting Kit with  
18 screws (2 screws for  
the adapter and 2 screws  
for each module)**



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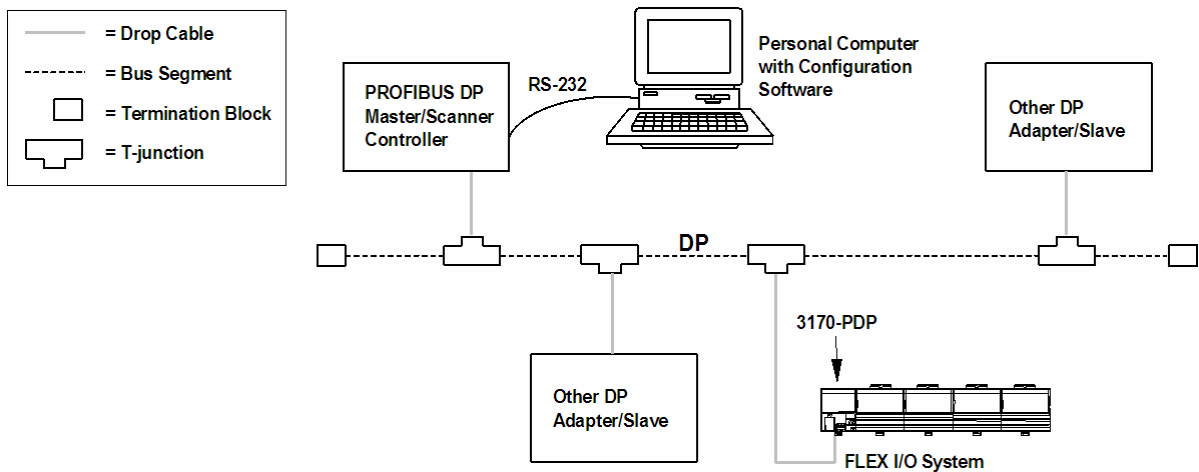


## 2.4 Purpose of the 3170-PDP

The 3170-PDP is a FLEX I/O adapter that interacts with the FLEX I/O backplane and any PROFIBUS DP master/scanner controller on a PROFIBUS DP network.

The 3170-PDP module is a slave device to the DP master/scanner, and is a master controller of the FLEX I/O system where it is installed.

The I/O data exchange occurs as follows: Output data is sent from the DP master/scanner controller across the PROFIBUS DP network to the 3170-PDP adapter. The adapter then automatically transfers the data across the FLEX I/O backplane to the output modules. Inputs from the input modules are collected by the FLEX I/O adapter via the backplane and sent across the PROFIBUS DP network to the DP master/scanner controller.

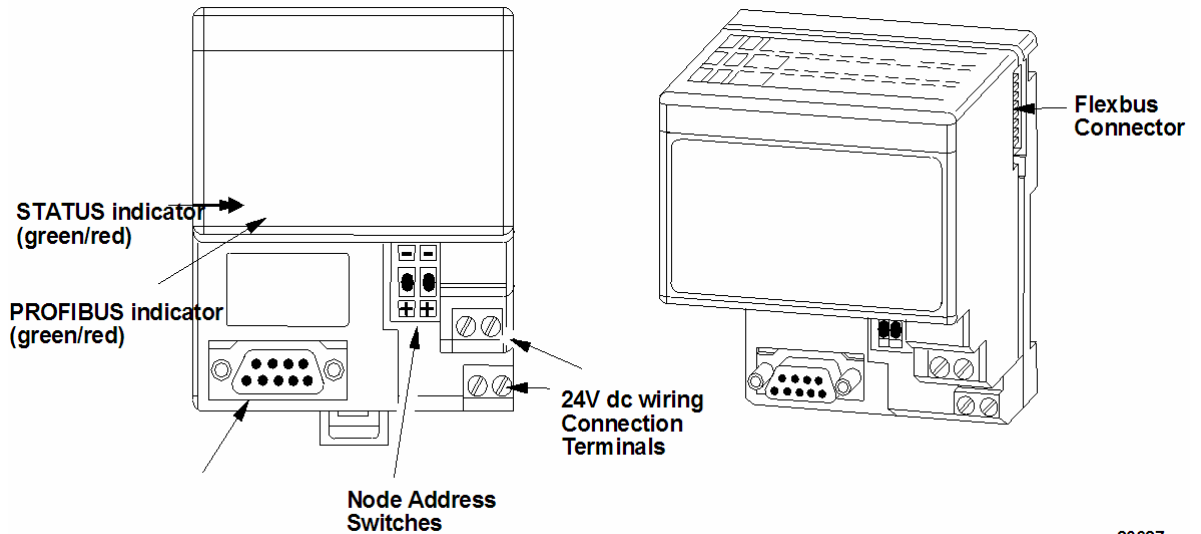




## 2.5 PROFIBUS Adapter Components

The adapter module consists of the following components:

- two diagnostic indicators
- PROFIBUS DP network connector
- 24V dc power wiring connection terminals
- two node address switches



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### 2.5.1 Diagnostic Indicators

Diagnostic indicators are located on the front panel of the adapter module. They show both normal operation and error conditions in your FLEX I/O system. The indicators are:

- Device status (STATUS)
- Communication link status (PROFIBUS)

Upon power-up, the adapter goes to an initialization state and performs a self-test (memory check, data memory clear). The indicators also go through a self-test sequence. If a failure occurs, the adapter transitions to a faulted state and waits for reset (cycle power). Otherwise, the adapter begins monitoring the network (run state) for messages.

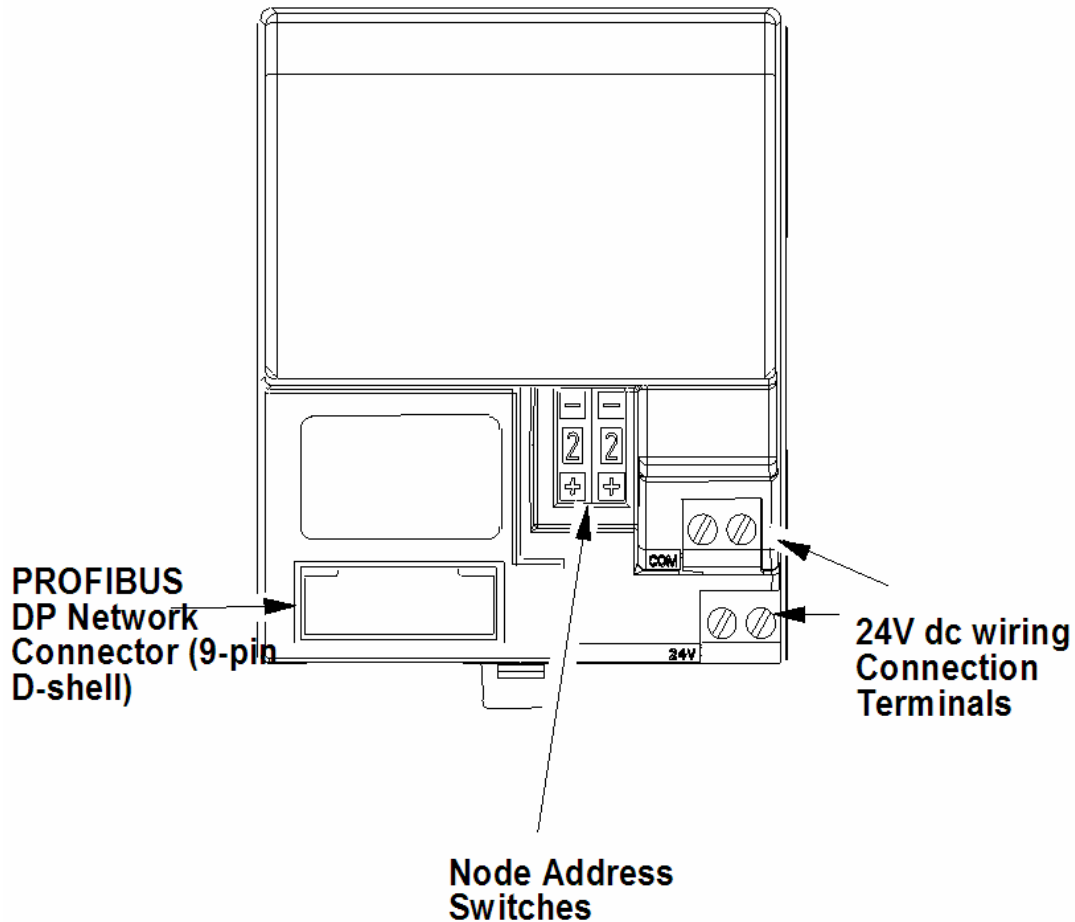
Chapter 5 describes the diagnostic indicators and how to use them for troubleshooting.

### 2.5.2 Network Connector

Use the 9-pin D-shell connector to connect your adapter to the PROFIBUS network.

### 2.5.3 Setting the Node Address Switches

Set the node address using the 2-position thumbwheel switch. Valid settings range from 01 to 99. Use a pen to press either the + or - buttons to change the number.



### 2.5.4 Power Wiring

Connections are provided for connecting the required 24V dc power to the front of the module. The power wiring can be daisy-chained to the terminal base unit located next to the adapter to supply power to the module installed in that base unit.

Refer to the Installation Instructions (pub. no. 801.09) you received with your adapter to learn how to install and wire the adapter.

### 3 How Communication Takes Place and I/O Image Table Mapping

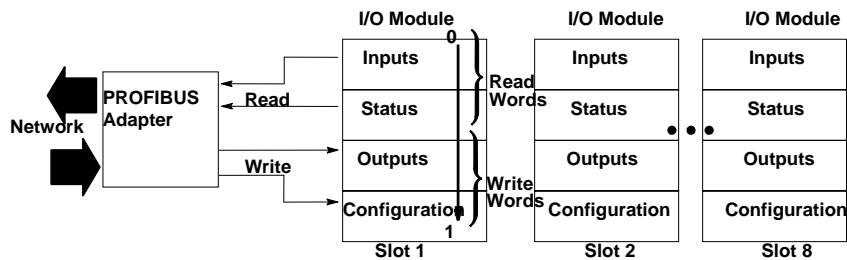
*In This Chapter*

- Polled I/O Structure..... 20
- Mapping Data into the Image Table ..... 22
- Connection Status Word Definition ..... 42
- Logic Status/Analog Feedback Definition..... 42
- Connection Enable Word Definition ..... 42
- Logic Command/Analog Reference Definition ..... 42
- Defaults..... 43

In this chapter, you will learn about:

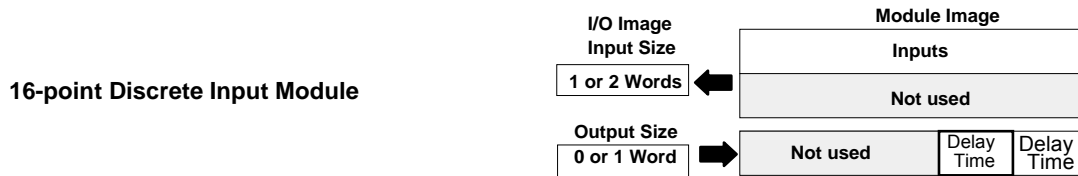
- communication over the FLEX I/O backplane (between the PROFIBUS adapter and the I/O modules)
- how data is mapped into the I/O image table

One 3170-PDP PROFIBUS adapter can interface with up to eight terminal base units with installed FLEX I/O modules, forming a FLEX I/O system of up to eight slots. The adapter communicates to other network system components over the PROFIBUS network. The adapter communicates with its I/O modules over the backplane.



The I/O map for a module is divided into read words and write words. Read words consist of input and status words, and write words consist of output and configuration words. The number of read words or write words can be 0 or more. The length of each I/O module's read words and write words vary in size depending on module complexity. Each I/O module will support at least 1 input word or 1 output word. Status and configuration are optional, depending on the module.

For example, a 16 point discrete input module will have up to 2 read words and 1 write word.

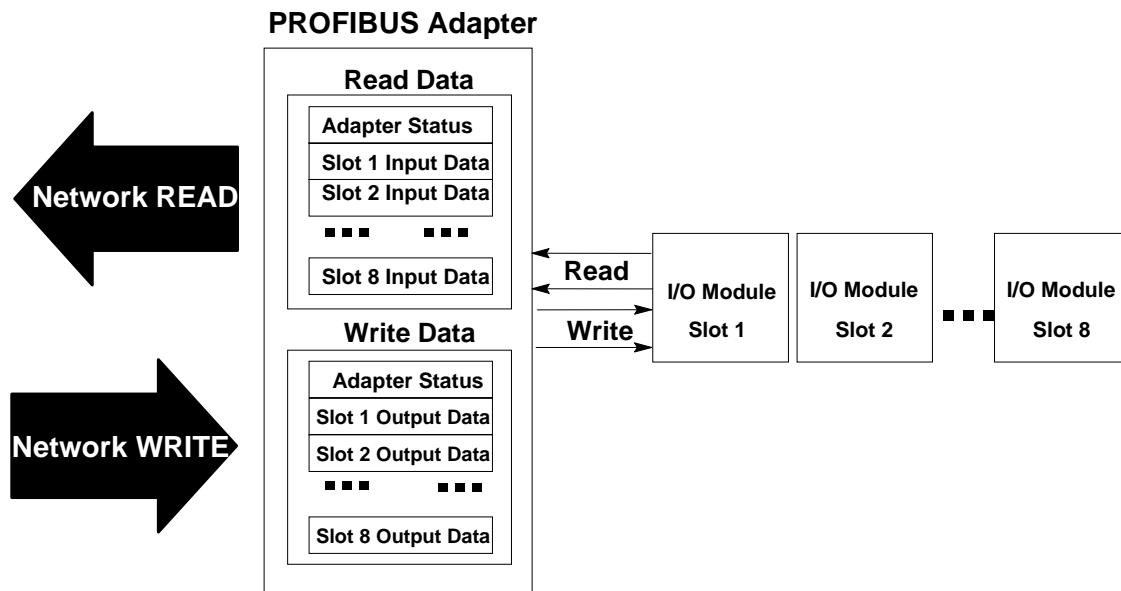


Refer to the I/O map for each module for the exact mapping.

### 3.1 Polled I/O Structure

The first word of output data sent by the adapter is the Adapter Status Word. Output data is received by the adapter in the order of the installed I/O modules. The Output data for Slot 1 is received first, followed by the Output data for Slot 2, and so on up to slot 8. All bits in the output status word are reserved

The first word of input data sent by the adapter is the Adapter Status Word. This is followed by the input data from each slot, in the order of the installed I/O modules. The Input data from Slot 1 is first after the status word, followed by Input data from Slot 2, and so on up to slot 8.

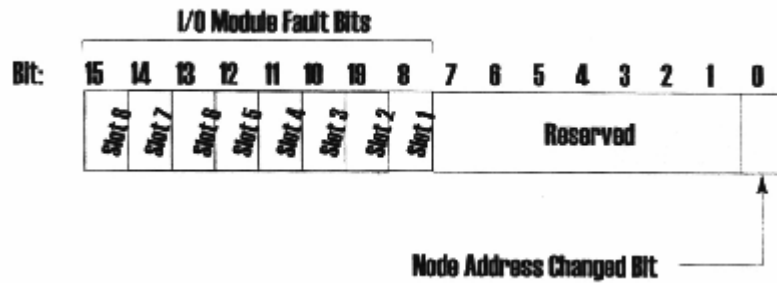


#### 3.1.1 Adapter Input Status Word

The input status word consists of:

- I/O module fault bits – 1 status bit for each slot

- node address changed – 1 bit



The adapter input status word bit descriptions are shown in the following table.

Bit Description	Bit	Explanation
I/O Module Fault	8	This bit is set (1) when an error is detected in slot position 1.
	9	This bit is set (1) when an error is detected in slot position 2.
	10	This bit is set (1) when an error is detected in slot position 3.
	11	This bit is set (1) when an error is detected in slot position 4.
	12	This bit is set (1) when an error is detected in slot position 5.
	13	This bit is set (1) when an error is detected in slot position 6.
	14	This bit is set (1) when an error is detected in slot position 7.
	15	This bit is set (1) when an error is detected in slot position 8.
Reserved	1 to 7	Reserved
Node Address Changed	0	This bit is set (1) when the node address switch setting has been changed since power up.

Possible causes for an **I/O module fault** are:

- transmission errors on the FLEX I/O backplane
- a failed module
- a module removed from its terminal base
- incorrect module inserted in a slot position
- the slot is empty

The **node address changed** bit is set when the node address switch setting has been changed since power up. The new node address does not take affect until the adapter has been powered down and then powered back up. Until this power cycling occurs, the node address switches will not match the actual node address.

### 3.2 Mapping Data into the Image Table

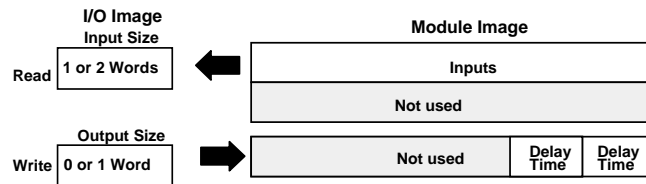
All FLEX I/O modules in the following table are supported by the PROFIBUS adapter. Presently, these consist of:

Module Description	Catalog Number	
AC Modules	1794-IA8	
	1794-IA8I	
	1794-IA16	
	1794-OA8	
	1794-OA8I	
	1794-OA16	
	1794-IM8	
	1794-OM8	
	DC Modules	1794-IB8
		1794-IB8S
1794-IB16		
1793-IB16/A, S/A		
1794-IV16		
1793-IV16/A, S/A		
1794-OB8		
1794-OB16		
1794-OB16P		
1793-OB16P/A, S/A		
1794-OV16		
1794-OV16P		
1793-OV16P/A, S/A		
1794-OB8EP		
1794-IB10XOB6		
1794-IC16		
1794-OC16		
1793-IB4(S)		
1793-OB4P(S)		
1793-IB2XOB2P(S)		
1794-IB32/A		
1794-OB32P		
1794-IB16XOB16P		
Analog Modules	1794-IE8	
	1794-OE4	
	1794-IE4XOE2	
	1793-IE4(S)	
	1793-OE2(S)	
1793-IE2XOE1(S)		

Module Description	Catalog Number
Isolated Analog Modules	1794-IF4I
	1794-OF4I
	1794-IF2XOF2I
Relay Modules	1794-OW8
	1793-OW4(S)
Special Modules	1794-IR8
	1794-IRT8
	1794-IT8
	1794-IJ2
	1794-ID2
	1794-IP4
Bentley Nevada Autoc	1203-FM1
	BN 1701-15 Rad Vib Mon
	BN 1701-15 Thrust Mon
	BN 1701-25 Vel In Mon
	BN 1701-25 Acc In Mon

The following topics show typical examples from Rockwell Automation product literature.

### 3.2.1 1794-IB16 – 16-point Discrete Input Module Image Table Mapping



#### 1794-IB16 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	Read Word 1
	Not used															Read Word 2	
	Not used											DT 12 to 15	DT 00 to 11	Write Word 1			

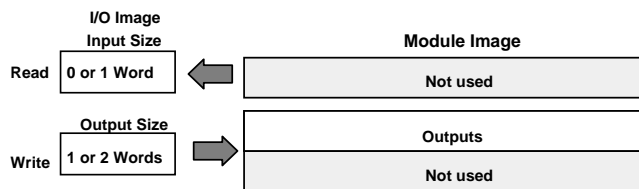
Where D = Input Data (D0 corresponds to input 0, D1 corresponds to input 1, etc.

DT = Input Delay Time (DT 00 to 11 corresponds to inputs 0 thru 11; DT 12 to 15 corresponds to inputs 12 thru 15)

***1794-IB16 Input Delay Times***

Bits	Description	Selected Delay Time
02 01 00	Delay Time for Inputs 00 to 11	
05 04 03	Delay Time for Inputs 12 to 15	
0 0 0	Delay Time 0 (default)	512µs
0 0 1	Delay Time 1	1ms
0 1 0	Delay Time 2	2ms
0 1 1	Delay Time 3	4ms
1 0 0	Delay Time 4	8ms
1 0 1	Delay Time 5	16ms
1 1 0	Delay Time 6	32ms
1 1 1	Delay Time 7	64ms

**3.2.2 1794-OB16 – 16-point Discrete Output Module Image Table Mapping**



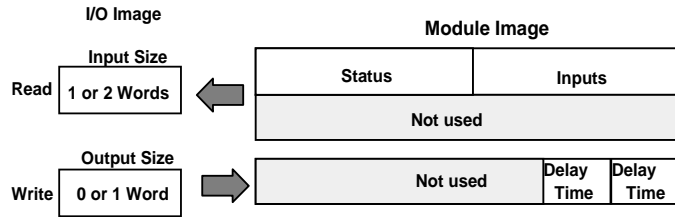
***1794-OB16 Memory Map***

Decimal	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Octal. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	Not used																Read Word 1
	015	014	013	012	011	010	09	08	07	06	05	04	03	02	01	00	Write Word 1
	Not used																Write Word 2

Where O = Output value (O0 corresponds to output 0, O1 corresponds to output 1, etc.)



### 3.2.3 1794-IB8S – 8-point Discrete Sensor Input Module Image Table Mapping



#### 1794-IB8S Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	S7	S6	S5	S4	S3	S2	S1	S0	D7	D6	D5	D4	D3	D2	D1	D0	Read Word 1
	Not used															Read Word 2	
	Not used															DT 12 to 15 DT 00 to 11	Write Word 1

Where S = Status of input (where S1 corresponds to the diagnostic bit for input 1, S2 corresponds to the diagnostic bit for input 2, etc.)

D = Input Data (where D0 corresponds to input 0, D1 corresponds to input 1, etc.)

DT = Input Delay Time (where DT 00 to 11 corresponds to inputs 0 thru 11; DT 12 to 15 corresponds to inputs 12 thru 15.)

The delay time for 00 to 11 must be the same as the delay time for 12 to 15.

#### Smart Sensor

Bits 08 to 15	S = Diagnostic data – 1 = Fault present (Smart) 0 = Normal (no errors)	Bits 00 to 07	D = Input data 0 = Sensor off 1 = Sensor on
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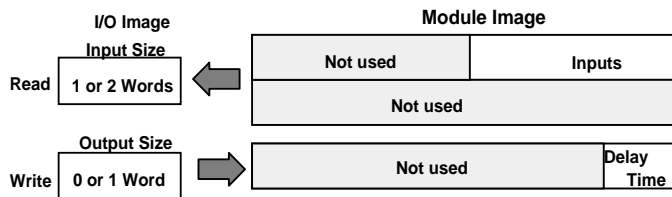
#### Standard Sensor

Bits 08 to 15	S = Diagnostic data – 1 = Diagnostics not disabled 0 = Normal (Disabled)	Bits 00 to 07	D = Input data 0 = Sensor off 1 = Sensor on
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#### 1794-IB8S Input Delay Times

Bits	Description	Selected Delay Time
02 01 00	Delay Time for Inputs 00 to 11	
05 04 03	Delay Time for Inputs 12 to 15	
0 0 0	Delay Time 0 (default)	512µs
0 0 1	Delay Time 1	1ms
0 1 0	Delay Time 2	2ms
0 1 1	Delay Time 3	4ms
1 0 0	Delay Time 4	8ms
1 0 1	Delay Time 5	16ms
1 1 0	Delay Time 6	32ms
1 1 1	Delay Time 7	64ms

### 3.2.4 1794-IA8 – 8-point Discrete Input Module Image Table Mapping



#### 1794-IA8 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	Not used							D7	D6	D5	D4	D3	D2	D1	D0		Read Word 1
	Not used							Read Word 2									
	Not used															Write Word 1	

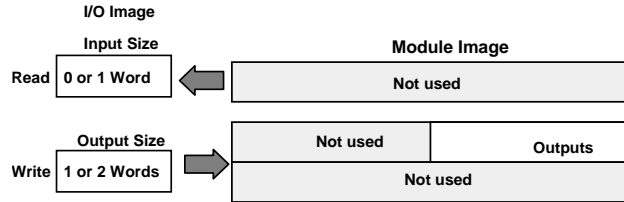
Where D = Input Data (where D0 corresponds to input 0, D1 corresponds to input 1, etc.)

DT = Input Delay Time (where DT 00 to 07 corresponds to inputs 0 thru 7)

#### 1794-IA8 Input Delay Times

Bits	Description	Maximum Delay Time
02 01 00	Delay Time for Inputs 00 to 07	Off to On                      On to Off
0 0 0	Delay Time 0 (default)	8.6ms                      26.6ms
0 0 1	Delay Time 1	9ms                      27ms
0 1 0	Delay Time 2	10ms                      28ms
0 1 1	Delay Time 3	12ms                      30ms
1 0 0	Delay Time 4	17ms                      35ms
1 0 1	Delay Time 5	26ms                      44ms
1 1 0	Delay Time 6	43ms                      61ms
1 1 1	Delay Time 7	78ms                      96ms

### 3.2.5 1794-OA8 – 8-point Discrete Output Module Image Table Mapping

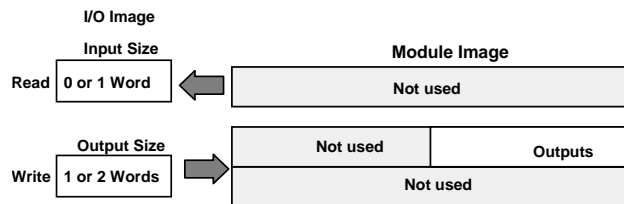


#### 1794-OA8 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	Not used						Read Word 1						Read Word 1				
	Not used						07 06 05 04 03 02 01 00						Write Word 1				
	Not used						Write Word 2						Write Word 2				

Where O = Output value (where O0 corresponds to output 0, O1 corresponds to output 1, etc.)

### 3.2.6 1794-OW8 – 8-point Discrete Relay Output Module Image Table Mapping

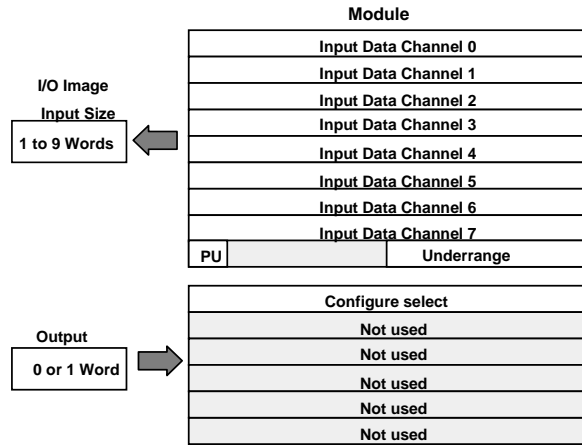


#### 1794-OW8 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	Not used						Read word 1						Read Word 1				
	Not used						07 06 05 04 03 02 01 00						Write Word 1				
	Not used						Write word 2						Write Word 2				

Where O = Output value: where O0 corresponds to output 0, O1 corresponds to output 1, etc., and when bit = 0, the output is off; when bit = 1, the output is on.

### 3.2.7 1794-IE8 – 8 Input Analog Module



#### 1794-IE8 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
S	Analog Value Channel 0													Read Word 1	Read Word 1		
S	Analog Value Channel 1													Read Word 2	Read Word 2		
S	Analog Value Channel 2													Read Word 3	Read Word 3		
S	Analog Value Channel 3													Read Word 4	Read Word 4		
S	Analog Value Channel 4													Read Word 5	Read Word 5		
S	Analog Value Channel 5													Read Word 6	Read Word 6		
S	Analog Value Channel 6													Read Word 7	Read Word 7		
S	Analog Value Channel 7													Read Word 8	Read Word 8		
PU	Not used – set to zero								U7	U6	U5	U4	U3	U2	U1	U0	Read Word 9
C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0	Write Word 1	
Not used – set to 0																Write Word 2 thru 6	

Where: PU = Power up bit – included in series B modules only.  
 U = Underrange bits for 4 to 20mA inputs  
 C = Configure select bit  
 F = Full range bit  
 S = sign bit (in 2's complement)

1794-IE8 Range Selection Bits

Channel No.	Channel 0		Channel 1		Channel 2		Channel 3		Channel 4		Channel 5		Channel 6		Channel 7	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5	F6	C6	F7	C7
Decimal Bit	00	08	01	09	02	10	03	11	04	12	05	13	06	14	07	15
0 to 10V dc/0 to 20mA	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
4 to 20mA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Do Not Use1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

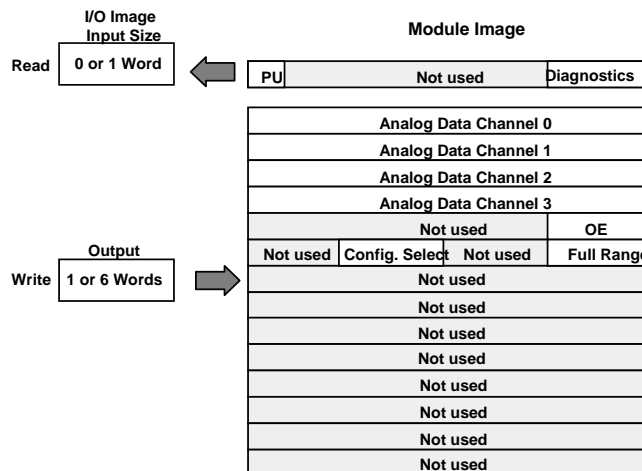
1 Do not use this configuration. Individual channels revert to 4 to 20mA if bit selection is all zeroes.

1794-IE8 Word/Bit Descriptions

Word	Decimal Bit	Definition
Read Word 1	Bits 00 to 14	Channel 0 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 0 analog data sign bit.
Read Word 2	Bits 00 to 14	Channel 1 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 1 analog data sign bit.
Read Word 3	Bits 00 to 14	Channel 2 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 2 analog data sign bit.
Read Word 4	Bits 00 to 14	Channel 3 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 3 analog data sign bit.
Read Word 5	Bits 00 to 14	Channel 4 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 4 analog data sign bit.
Read Word 6	Bits 00 to 14	Channel 5 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 5 analog data sign bit.
Read Word 7	Bits 00 to 14	Channel 6 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 6 analog data sign bit.

Word	Decimal Bit	Definition
Read Word 8	Bits 00 to 14	Channel 7 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 7 analog data sign bit.
Read Word 9	Bits 00 to 07	Underrange bits (U) for individual channels (4 to 20mA current input only)- Bit 00 corresponds to input channel 0, bit 01 corresponds to input channel 1, and so on. When set (1), indicates either a broken or open input wire, or input current below 4 to 20mA.
	Bits 08 to 14	Not used – set to 0.
	Bit 15	Power Up bit – included in series B modules only. This bit is 0 in series A modules. This bit is set to 1 when all bits in the configuration register are 0 (unconfigured state). The configuration register can be cleared by either of the reset inputs, or by the user writing all zeroes to it.
Write Word 1	Bits 00 to 07	Full range bits (F) for individual channels – Bit 00 corresponds to input channel 0, bit 01 corresponds to input channel 1, and so on. Refer to range selection above.
	Bits 08 to 15	Configure select bits (C) for individual channels – Bit 08 corresponds to input channel 0, bit 09 corresponds to input channel 1, and so on. Refer to range selection above.
Write Word 2	Bits 00 to 15	Not used – set to 0.
Write Word 3	Bits 00 to 15	Not used – set to 0.
Write Word 4	Bits 00 to 15	Not used – set to 0.
Write Word 5	Bits 00 to 15	Not used – set to 0.
Write Word 6	Bits 00 to 15	Not used – set to 0.

### 3.2.8 1794-OE4 – 4 Output Analog Module Image Table Mapping



1794-OE4 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	PU	Not used – set to 0											W3	W2	W1	W0	Read Word 1
	S	Analog Data – Channel 0															Write Word 1
	S	Analog Data – Channel 1															Write Word 2
	S	Analog Data – Channel 2															Write Word 3
	S	Analog Data – Channel 3															Write Word 4
	Not used – set to 0											OE3	OE2	OE1	OE0	Write Word 5	
	Not used – set to 0			C3	C2	C1	C0	Not used – set to 0				F3	F2	F1	F0	Write Word 6	
	Not used – set to 0															Write Words 7 thru 14	

Where: PU = Power up bit – included in series B modules only.

W = Diagnostic bits for current output wire broken or load resistance high. (Not used on voltage outputs.)

S = Sign bit (in 2's complement)

OE = Output enable bits (bit 00 corresponds to output 0, bit 01 corresponds to output 1 and so on.

ATTENTION: These bits must be

set to 1.

C = Configure select bit

F = Full range bit

1794-OE4 Range Selection Bits (Write Word 6)

Channel No.	Channel 0		Channel 1		Channel 2		Channel 3	
	F0	C0	F1	C1	F2	C2	F3	C3
Decimal Bit	00	08	01	09	02	10	03	11
4 to 20mA	0	1	0	1	0	1	0	1
0 to 10V dc/0 to 20mA	1	0	1	0	1	0	1	0
to 10 to +10V dc	1	1	1	1	1	1	1	1
Off1	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

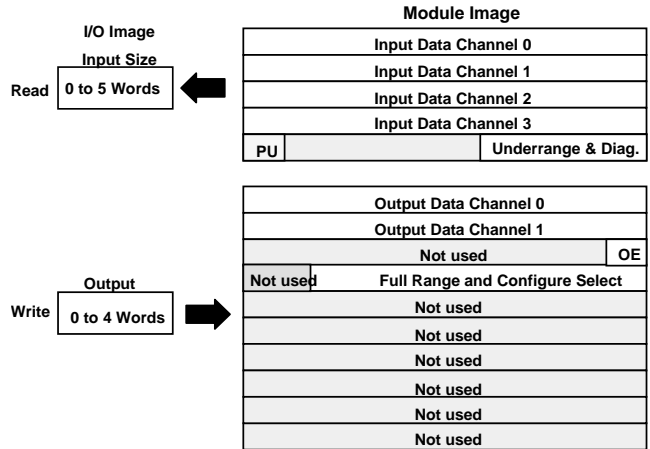
1 When configured to off, individual channels will return 0V.

1794-OE4 Word/Bit Descriptions

Word	Decimal Bit	Definition
Read Word 1	Bits 00 to 03	Current outputs only – When set (1), the wire on the output is broken or the load resistance is too high. Bit 00 corresponds to channel 0, bit 01 corresponds to channel 2, and so on.
	Bits 04 to 14	Not used – set to 0.
	Bit 15	Power Up bit – included in series B modules only. This bit is 0 in series A modules. This bit is set to 1 when all bits in the configuration register are 0 (unconfigured state). The configuration register can be cleared by either of the reset inputs, or by the user writing all zeroes to it.
Write Word 1	Bits 00 to 14	Channel 0 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 0 analog data sign bit.
Write Word 2	Bits 00 to 14	Channel 1 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 1 analog data sign bit.
Write Word 3	Bits 00 to 14	Channel 2 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 2 analog data sign bit.
Write Word 4	Bits 00 to 14	Channel 3 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 3 analog data sign bit.
Write Word 5	Bits 00 to 03	Output Enable bits. Bit 00 corresponds to input 0, bit 01 corresponds to input 1, bit 02 corresponds to input 2, and bit 03 corresponds to input 3. These bits must be set to 1.
	Bits 04 to 15	Not used – set to 0.
Write Word 6	Bits 00 to 03	Full range bits (F) for individual channels – Bit 00 corresponds to output channel 0, bit 01 corresponds to output channel 1, and so on. Refer to range selection above.
	Bits 04 to 07	Not used – set to 0.
	Bits 08 to 11	Configure select bits (C) for individual channels – Bit 08 corresponds to output channel 0, bit 09 corresponds to output channel 1, and so on. Refer to range selection above.
	Bits 12 to 15	Not used – set to 0.
Write Word 7	Bits 00 to 15	Not used – set to 0.
Write Word 8	Bits 00 to 15	Not used – set to 0.
Write Word 9	Bits 00 to 15	Not used – set to 0.
Write Word 10	Bits 00 to 15	Not used – set to 0.
Write Word 11	Bits 00 to 15	Not used – set to 0.
Write Word 12	Bits 00 to 15	Not used – set to 0.
Write Word 13	Bits 00 to 15	Not used – set to 0.
Write Word 14	Bits 00 to 15	Not used – set to 0.



### 3.2.9 1794-IE4XOE2 – Analog Combo Module Image Table Mapping



#### 1794-IE4XOE2 Memory Map

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Size
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	Read Words
	S	Analog Value Input Channel 0															Read Word 1
	S	Analog Value Input Channel 1															Read Word 2
	S	Analog Value Input Channel 2															Read Word 3
	S	Analog Value Input Channel 3															Read Word 4
	PU	Not used – set to 0									W1	W0	U3	U2	U1	U0	Read Word 5
	S	Analog Data – Output Channel 0															Write Word 1
	S	Analog Data – Output Channel 1															Write Word 2
	Not used – set to 0														OE1	OE0	Write Word 3
	Not used		C5	C4	C3	C2	C1	C0	0	0	F5	F4	F3	F2	F1	F0	Write Word 4
	Not used – set to 0															Write Word 5 thru 10	

Where: PU = Power up bit – included in series B modules only.

W = Diagnostic bits for current output wire broken or load resistance high. (Not used on voltage outputs.)

U = Underrange bits for 4 to 20mA inputs

OE = Output enable bits (bit 00 corresponds to output 0, bit 01 corresponds to output 1).

ATTENTION: These bits must be set to 1.

S = Sign bit (in 2's complement)

C = Configure select bit

F = Full range bit

***1794-IE4XOE2 Range Selection Bits***

Channel No.	Input Channel 0		Input Channel 1		Input Channel 2		Input Channel 3		Output Channel 0		Output Channel 1	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5
Decimal Bit	00	08	01	09	02	10	03	11	04	12	05	13
4 to 20mA	0	1	0	1	0	1	0	1	0	1	0	1
0 to 10V dc/0 to 20mA	1	0	1	0	1	0	1	0	1	0	1	0
to 10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1
Off1	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

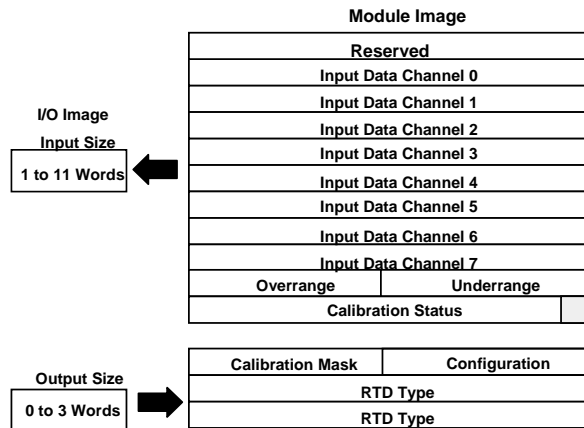
1When configured to off, individual channels will return either 0V or 0mA.

***1794-IE4XOE2 Word/Bit Descriptions***

Word	Decimal Bit	Definition
Read Word 1	Bits 00 to 14	Channel 0 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 0 analog data sign bit.
Read Word 2	Bits 00 to 14	Channel 1 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 1 analog data sign bit.
Read Word 3	Bits 00 to 14	Channel 2 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 2 analog data sign bit.
Read Word 4	Bits 00 to 14	Channel 3 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 3 analog data sign bit.
Read Word 5	Bits 00 to 03	Underrange bits (U) for individual channels (4 to 20mA current inputs only) – Bit 00 corresponds to input channel 0, bit 01 corresponds to input channel 1, and so on.
	Bits 04 to 05	Wire Off bits (W) – Current outputs only – When set (1), the wire on the current output is broken or the load resistance is too high. Bit 00 corresponds to channel 0, bit 01 corresponds to channel 2, and so on.
	Bits 06 to 14	Not used – set to 0.
	Bit 15	Power Up bit – included in series B modules only. This bit is 0 in series A modules. This bit is set to 1 when all bits in the configuration register are 0 (unconfigured state). The configuration register can be cleared by either of the reset inputs, or by the user writing all zeroes to it.
Write Word 1	Bits 00 to 14	Channel 0 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 0 analog data sign bit.
Write Word 2	Bits 00 to 14	Channel 1 analog data – 12-bit left justified two's complement number; unused lower bits are zero; 4 to 20mA uses all 16 bits.
	Bits 15	Channel 1 analog data sign bit.
Write Word 3	Bits 00 to 01	Output Enable bits. Bit 00 corresponds to output 0, bit 01 corresponds to output 1. These bits must be set to 1.

Word	Decimal Bit	Definition
	Bits 02 to 15	Not used – set to 0.
Write Word 4	Bits 00 to 05	Full range bits (F) for individual channels – Bit 00 corresponds to input channel 0, bit 01 corresponds to input channel 1, bit 02 corresponds to input channel 3, bit 03 corresponds to input channel 3, bit 04 corresponds to output channel 1, and bit 05 corresponds to output channel 2. Refer to range selection above.
	Bits 06 to 07	Not used – set to 0.
	Bits 08 to 13	Configure select bits (C) for individual channels – Bit 08 corresponds to input channel 0, bit 09 (11) corresponds to input channel 1, bit 10 (12) corresponds to input channel 2, bit 11 (13) corresponds to input channel 3, bit 12 (14) corresponds to output channel 0, and bit 13 (15) corresponds to output channel 1. Refer to range selection above.
	Bits 14 to 15	Not used – set to 0.
Write Word 5	Bits 00 to 15	Not used – set to 0.
Write Word 6	Bits 00 to 15	Not used – set to 0.
Write Word 7	Bits 00 to 15	Not used – set to 0.
Write Word 8	Bits 00 to 15	Not used – set to 0.
Write Word 9	Bits 00 to 15	Not used – set to 0.
Write Word 10	Bits 00 to 15	Not used – set to 0.

### 3.2.10 1794-IR8 – RTD Input Analog Module Image Table Mapping



#### 1794-IR8 Read

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 1	Reserved															
Read Word 2	Channel 0 Input Data															
Read Word 3	Channel 1 Input Data															
Read Word 4	Channel 2 Input Data															
Read Word 5	Channel 3 Input Data															
Read Word 6	Channel 4 Input Data															

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Read Word 7	Channel 5 Input Data															
Read Word 8	Channel 6 Input Data															
Read Word 9	Channel 7 Input Data															
Read Word 10	Overrange Bits								Underrange Bits							
Read Word 11	0	0	0	0	0	Bad Cal	Cal Done	Cal Range	0	Diagnostic Status Bits	Pwr Up	0	0	0	0	0

**1794-IR8 Write**

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Oct. Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Write Word 1	8-bit Calibration Mask								Cal Clk	Cal Hi	Filter Cutoff	Cal Lo	Enh	MDT		
Write Word 2	RTD 3 Type				RTD 2 Type				RTD 1 Type				RTD 0 Type			
Write Word 3	RTD 7 Type				RTD 6 Type				RTD 5 Type				RTD 4 Type			

Where: Enh = Enhanced  
 MDT = Module Data Type

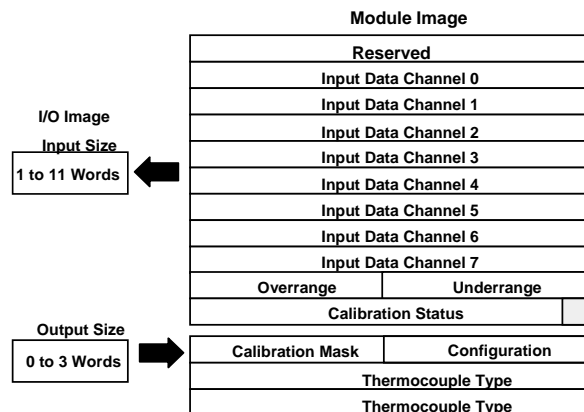
**1794-IR8 Word/Bit Descriptions**

Word	Dec. Bits (Octal Bits)	Description
Read Word 1	00 to 15 (00 to 17)	Reserved
Read Word 2	00 to 15 (00 to 17)	Channel 0 Input data
Read Word 3	00 to 15 (00 to 17)	Channel 1 Input data
Read Word 4	00 to 15 (00 to 17)	Channel 2 Input data
Read Word 5	00 to 15 (00 to 17)	Channel 3 Input data
Read Word 6	00 to 15 (00 to 17)	Channel 4 Input data
Read Word 7	00 to 15 (00 to 17)	Channel 5 Input data
Read Word 8	00 to 15 (00 to 17)	Channel 6 Input data
Read Word 9	00 to 15 (00 to 17)	Channel 7 Input data
Read Word 10	00 to 07	Underrange bits – these bits are set if the input signal is below the input channel's minimum range.
	08 to 15 (10 to 17)	Overrange bits – these bits are set if 1), the input signal is above the input channel's maximum range, or 2), an open detector is detected.
Read Word 11	00 to 01	Not used – set to 0
	02	Reserved
	03	Powerup bit – this bit is set (1) until configuration data is received by the module.
	04 to 06	Critical Error bits – If these bits are anything other than all zeroes, return the module to the factory for repair
	07	Unused – set to 0

Word	Dec. Bits (Octal Bits)	Description
	08 (10)	Calibration Range bit – set to 1 if a reference signal is out of range during calibration
	09 (11)	Calibration Done bit – set to 1 after an initiated calibration cycle is complete.
	10 (12)	Calibration Bad bit – set to 1 if the channel has not had a valid calibration.
	11 to 15 (13 to 17)	Unused – set to 0
Write word 1	00 to 01	Module Data Type
		Bit 01 00
		0 0 °C (default)
		0 1 °F
		1 0 Bipolar counts scaled between –32768 and +32767
		1 1 Unipolar counts scaled between 0 and 65535
	02	Enhanced mode select – measures voltage drop across a precision resistor in the module to compare with the unknown input.
	03 to 05	A/D Filter First Notch Frequency
		Bit 05 04 03 Definition
		0 0 0 10Hz (default)
		0 0 1 25Hz
		0 1 0 50Hz
		0 1 1 60Hz
		1 0 0 100Hz
		1 0 1 250Hz
		1 1 0 500Hz
		1 1 1 1000hZ
	06	Calibration High/Low bit – This bit is set during gain calibration; reset during offset calibration.
	07	Calibration clock – this bit must be set to 1 to prepare for a calibration cycle; then reset to 0 to initiate calibration.
	08 to 15	Calibration mask – The channel, or channels, to be calibrated will have the correct mask bit set. Bit 0 corresponds to channel 0, bit 1 to channel 1, and so on.
Write Word 2	00 to 03	Channel 0 RTD Type
		Bit 03 02 01 00 RTD Type – Range
		0 0 0 0 Resistance (default)
		0 0 0 1 No sensor connected – do not scan
		0 0 1 0 100 ohm Pt $\alpha$ = 0.00385 Euro (–200 to +870°C)
		0 0 1 1 100 ohm Pt $\alpha$ = 0.003916 U.S. (–200 to +630°C)
		0 1 0 0 200 ohm Pt $\alpha$ = 0.00385 (–200 to +630°C)

Word	Dec. Bits (Octal Bits)	Description
		0 1 0 1 500 ohm Pt $\alpha$ = 0.00385 (-200 to +630°C)
		0 1 1 0 Reserved
		0 1 1 1 10 ohm Copper (-200 to +260°C)
		1 0 0 0 120 ohm Nickel (-60 to +250°C)
		1 0 0 1 100 ohm Nickel (-60 to +250°C)
		1 0 1 0 200 ohm Nickel (-60 to +250°C)
		1 0 1 1 500 ohm Nickel (-60 to +250°C)
		1 1 0 0 Module data time stamp
		1101 to 1111 – Reserved
	04 to 07	Channel 1 RTD Type (see bits 00 to 03)
	08 to 11	Channel 2 RTD Type (see bits 00 to 03)
	12 to 15	Channel 3 RTD Type (see bits 00 to 03)
Write Word 3	00 to 03	Channel 4 RTD Type (see write word 2, bits 00 to 03)
	04 to 07	Channel 5 RTD Type (see write word 2, bits 00 to 03)
	08 to 11	Channel 6 RTD Type (see write word 2, bits 00 to 03)
	12 to 15	Channel 7 RTD Type (see write word 2, bits 00 to 03)

### 3.2.11 1794-IT8 – Thermocouple Input Module Image Table Mapping



#### 1794-IT8 Read

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 1	Reserved															
Read Word 2	Channel 0 Input Data															
Read Word 3	Channel 1 Input Data															
Read Word 4	Channel 2 Input Data															
Read Word 5	Channel 3 Input Data															

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 6	Channel 4 Input Data															
Read Word 7	Channel 5 Input Data															
Read Word 8	Channel 6 Input Data															
Read Word 9	Channel 7 Input Data															
Read Word 10	Overrange Bits								Underrange Bits							
Read Word 11	0	0	0	0	0	Bad Cal Cal	0	Diagnostics	Pwr Up	Bad Structure	CJC over	CJC Under				

**1794-IT8 Write**

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Write Word 1	8-Bit Calibration Mask								Cal Clk	Cal hi	Filter Cutoff	FDF	Data Type			
Write Word 2	Thermocouple 3 Type				Thermocouple 2 Type				Thermocouple 1 Type				Thermocouple 0 Type			
Write Word 3	Thermocouple 7 Type				Thermocouple 6 Type				Thermocouple 5 Type				Thermocouple 4 Type			

Where: FDF = fixed digital filter bit

**1794-IT8 Word/Bit Descriptions**

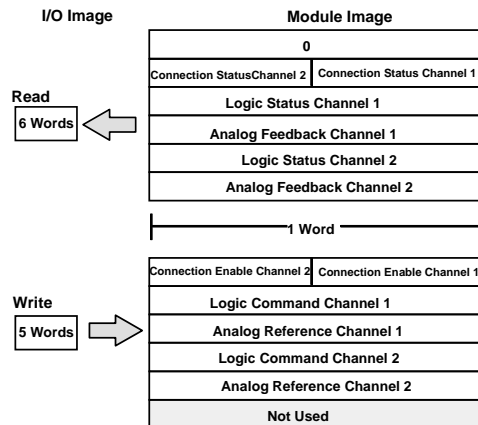
Word	Decimal Bit (Octal Bit)	Description
Read Word 1	00 to 15 (00 to 17)	Reserved
Read Word 2	00 to 15 (00 to 17)	Channel 0 Input data
Read Word 3	00 to 15 (00 to 17)	Channel 1 Input data
Read Word 4	00 to 15 (00 to 17)	Channel 2 Input data
Read Word 5	00 to 15 (00 to 17)	Channel 3 Input data
Read Word 6	00 to 15 (00 to 17)	Channel 4 Input data
Read Word 7	00 to 15 (00 to 17)	Channel 5 Input data
Read Word 8	00 to 15 (00 to 17)	Channel 6 Input data
Read Word 9	00 to 15 (00 to 17)	Channel 7 Input data
Read Word 10	00 to 07 (00 to 07)	Underrange bits – these bits are set if the input signal is below the input channel's minimum range.
	08 to 15 (10 to 17)	Overrange bits – these bits are set if 1), the input signal is above the input channel's maximum range, or 2), an open detector is detected.
Read Word 11	00 (00)	Cold Junction sensor underrange bit. – this bit is set if the cold junction temperature is below 0°C.
	01 (01)	Cold Junction sensor overrange bit. – this bit is set if the cold junction temperature is above 70°C.
	02 (02)	Bad Structure – this bit is set if there is an invalid thermocouple type selected.

Word	Decimal Bit (Octal Bit)	Description
	03 (03)	Powerup bit – this bit is set (1) until configuration data is received by the module.
	04 to 06 (04 to 06)	Critical Fault bits – If these bits are anything other than zero, return the module to the factory for repair.
	07 (07)	Unused – set to 0
	08 (10)	Calibration Range bit – set to 1 if a reference signal is out of range during calibration
	09 (11)	Calibration Done bit – set to 1 after an initiated calibration cycle is complete.
	10 (12)	Calibration Bad bit – set to 1 if the channel has not had a valid calibration.
	11 to 15 (13 to 17)	Unused – set to 0
Write Word 1	00 to 01 (00 to 01)	Module Data Type
	Bit	01 00 Definition
		0 0 °C (default)
		0 1 °F
		1 0 Bipolar counts scaled between –32768 and +32767
		1 1 Unipolar counts scaled between 0 and 65535
	Bit 02 (02)	Fixed Digital Filter – When this bit is set (1), a software digital filter is enabled. This filter settles to 100% of a Full Scale step input in 60 scans.
	03 to 05 (03 to 05)	A/D Filter First Notch Frequency
	Bit	05 04 03 Definition
		0 0 0 10Hz (default)
		0 0 1 25Hz
		0 1 0 50Hz
		0 1 1 60Hz
		1 0 0 100Hz
		1 0 1 250Hz
		1 1 0 500Hz
		1 1 1 1000hZ
	06 (06)	Calibration High/Low bit – This bit is set during gain calibration; reset during offset calibration.
	07 (07)	Calibration clock – this bit must be set to 1 to prepare for a calibration cycle; then reset to 0 to initiate calibration.
	08 to 15 (10 to 17)	Calibration mask – The channel, or channels, to be calibrated will have the correct mask bit set. Bit 8 corresponds to channel 0, bit 9 to channel 1, and so on.
Write Word 2	00 to 03 (00 to 03)	Channel 0 Thermocouple Type
	Bit	03 02 01 00 Thermocouple Type – Range
		0 0 0 0 Millivolts (default)
		0 0 0 1 300 to 1800°C (572 to 3272°F)
		0 0 1 0 –270 to 1000°C (–454 to 1832°F)

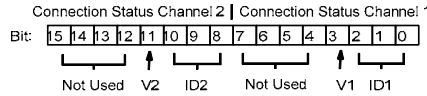


Word	Decimal Bit (Octal Bit)	Description
	0 0 1 1	-210 to 1200°C (-346 to 2192°F)
	0 1 0 0	-71 to 1372°C (-95 to 2502°F)
	0 1 0 1	-50 to 1768°C (-58 to 3214°F)
	0 1 1 0	-50 to 1768°C (-58 to 3214°F)
	0 1 1 1	-73 to 400°C (-99 to 752°F)
	1 0 0 0	0 to 2315°C (32 to 4199°F)
	1 0 0 1	-270 to 1300°C (-450 to 2372°F)
	1 0 1 0	Reserved
	1 0 1 1	Reserved
	1 1 0 0	Module reports cold junction temperature for channels 00 to 03
	1 1 0 1	Module reports cold junction temperature for channels 04 to 07
	1 1 1 0	Reserved
	1 1 1 1	No sensor connected (do not scan)
	04 to 07 (04 to 07)	Channel 1 Thermocouple Type (see bits 00 to 03)
	08 to 11 (10 to 13)	Channel 2 Thermocouple Type (see bits 00 to 03)
	12 to 15 (14 to 17)	Channel 3 Thermocouple Type (see bits 00 to 03)
Write Word 3	00 to 03 (00 to 03)	Channel 4 Thermocouple Type (see word 13, bits 00 to 03)
	04 to 07 (04 to 07)	Channel 5 Thermocouple Type (see word 13, bits 00 to 03)
	08 to 11 (10 to 13)	Channel 6 Thermocouple Type (see word 13, bits 00 to 03)
	12 to 15 (14 to 17)	Channel 7 Thermocouple Type (see word 13, bits 00 to 03)

### 3.2.12 1203-FM1 – SCANport Module Image Table Mapping



### 3.3 Connection Status Word Definition

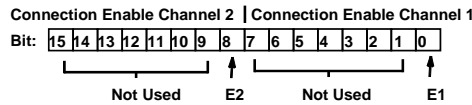


Description	
V1	SCANport channel 1 valid data bit. When high (1), the Logic Status and Analog Feedback values are valid and can be used. When low (0), the values should not be used.
ID1	SCANport channel 1 connected peripheral port ID number. This three bit field contains the port number that channel 1 is connected to on the SCANport device. It should contain a value between 1 and 7. If this field is 7, then the channel is not connected to the SCANport device, or the SCANport device may not be powered.
V2	SCANport channel 2 valid data bit. When high (1), the Logic Status and Analog Feedback values are valid and can be used. When low (0), the values should not be used.
ID2	SCANport channel 2 connected peripheral port ID number. This three bit field contains the port number that channel 2 is connected to on the SCANport device. It should contain a value between 1 and 7. If this field is 7, then the channel is not connected to the SCANport device, or the SCANport device may not be powered.

### 3.4 Logic Status/Analog Feedback Definition

The Logic Status and Analog Feedback values are defined within the product manuals of the connected SCANport device(s).

### 3.5 Connection Enable Word Definition



Description	
E1	SCANport channel 1 enable bit. When set to 1, the module will attempt to connect to the SCANport device. When reset to 0, the module stops communicating with the connected SCANport device. This usually causes the device to fault.
E2	SCANport channel 2 enable bit. When set to 1, the module will attempt to connect to the SCANport device. When reset to 0, the module stops communicating with the connected SCANport device. This usually causes the device to fault.

### 3.6 Logic Command/Analog Reference Definition

The Logic Command and Analog Reference values are defined within the product manuals of the connected SCANport device(s).

Each I/O module has default values associated with it. At default, each module will generate inputs/status and expect outputs/configuration.

### 3.7 Defaults

Module Defaults for:		Adapter Defaults		Optimal Sizes	
Catalog Number	Description	Input Default	Output Default	Input Default	Output Default
1794-IB16	16-pt 24V dc Sink Input	1	1	1	0
1794-OB16	16-pt 24V dc Source Output	1	1	0	1
1794-IA8	8-pt 120V ac Input	1	1	1	0
1794-OA8	8-pt 120V ac Output	1	1	0	1
1794-IB8S	8-pt 24V dc Sensor Input	1	1	1	0
1794-OW8	8-pt Relay Output	1	1	0	1
1794-IE8	8-pt Analog Input	9	6	8	0
1794-OE4	4-pt Analog Output	1	14	0	4
1794-IE4XOE2	4 in/2 out Analog Combo	5	10	4	2
1794-IR8	8-pt RTD Analog Input	11	4	10	0
1794-IT8	8-pt Thermocouple Input	11	4	10	0
1203-FM1	SCANport Module	6	5	4	3

The default values reflect the maximum number of read/write words.

You can change the I/O data size for a module by reducing the number of words mapped into the adapter module, as shown in optimal sizes.

**Optimal sizes** are the settings that provide optimal data to and from the I/O module. You need a software configuration tool to change

the size. If you are using the Rockwell Automation 1785-PFB/B coprocessor as a master, you must use the Rockwell Automation PROFIBUS Manager Software configuration tool. Because the FLEX I/O adapter is compatible with any master, you can use any comparable configuration tool available on the market.

The optimal settings provide the fastest network time by only mapping read and write words used by the I/O modules. If you reduce your data sizes to only include optimal data, you can only change your configuration data with a software tool. If you must change configuration information on an optimal basis, your data size must be large enough to include the necessary words.

If you are using PROFIBUS Manager Software to configure your adapter, refer to your PROFIBUS Manager Software User Manual, publication 1785-6.5.20 for more information.

For additional information on FLEX I/O modules, refer to the following publications.

Module Description	Catalog Number	Installation Instructions	User Manual
16 Sink Input Module	1794-IB16	1794-5.4	
16 Source Output Module	1794-OB16	1794-5.3	
8 Sensor Input Module	1794-IB8S	1794-5.7	
8 Input Module	1794-IA8	1794-5.9	

<b>Module Description</b>	<b>Catalog Number</b>	<b>Installation Instructions</b>	<b>User Manual</b>
8 Output Module	1794-OA8	1794-5.10	
8 Relay Output Module	1794-OW8	1794-5.19	
8 Input Analog Module	1794-IE8	1794-5.6	1794-6.5.2
4 Output Analog Module	1794-OE4	1794-5.5	
4 in/2 out Analog Combo Module	1794-IE4XOE2	1794-5.15	
8 RTD Input Analog Module	1794-IR8	1794-5.22	1794-6.5.4
8 Thermocouple Input Module	1794-IT8	1794-5.21	1794-6.5.7
SCANport Module	1203-FM1	1203-5.8	

## 4 Connect the Adapter to the PROFIBUS DP Network

### *In This Chapter*

- The DP Physical Layer..... 45
- Cabling and Equipment Required for Line A Type ..... 46
- Cabling and Equipment Required for Line B Type ..... 47
- Connect the Adapter to the Network ..... 48
- Terminate the Network ..... 49

### 4.1 The DP Physical Layer

The PROFIBUS network media is a balanced transmission line corresponding to the standard EIA RS-485, terminated at both ends. Both line A and line B types are available, depending on your system requirements.

Specifications and guidelines for DP media:

- linear bus, terminated at both ends
- drop cables (preferably no longer than .30m), no branches
- shielded twisted pair
- max. line length between 100 and 1200m (depending on baudrate and cable type)
- number of stations: 32
- DP baudrates 3, 6 and 12 M bit/s

Use the following table to determine what line type will best meet your needs.

Characteristic	Bus Segments and Drop Cables		
	Line A Requirements	Line B Requirements	Total Capacity of all Drop Cables
Impedance	135-165 W (3 to 29 MHz)	100 to 130 W (fu100 kHz)	
Capacity	t30 pF/m	t60 pF/m	
Resistance	t110 W/km	-	
Wire Gauge	u0.64 mm	u0.53 mm	
Conductor Area	u0.34 mm <sup>2</sup>	u0.22 mm <sup>2</sup>	

Characteristic	Bus Segments and Drop Cables			
	<=19.2k	1200 m2	1200 m2	<=15nF
Maximum Length <sup>1</sup> with a Baud Rate (bits/s) of:				
	93.75k	1200 m2	1200 m2	<=3nF
	187.5k	1000 m2	600 m2	<=1nF
	500k	400 m2	200 m2	<=0.6nF
	1.5M	200 m2	NA	<=0.2nF
	12 M	100 m2	NA	

NA = Not Applicable

<sup>1</sup> If using a combination of both line types, divide the lengths shown by two. <sup>2</sup> This is the sum of all bus segment and drop cable lengths.

Line A cabling can support baudrates as high as 12 M bits/s.

## 4.2 Cabling and Equipment Required for Line A Type

### 4.2.1 Cables

You need a shielded twisted pair cable for your cabling (bus segments or drop cables). Any line A cable available on the market can be used to connect your adapter to a PROFIBUS network.

### 4.2.2 T-junction Connectors

You need t-junction connectors to connect your droplines to bus segments. You can use any t-junctions available on the market.

### 4.2.3 Termination Blocks

Termination blocks are only needed if the devices on the end of the network do not have built-in terminating resistors. If you need termination blocks, you can use any termination blocks available on the market.

### 4.2.4 Bus Connector

Connect your adapter to the PROFIBUS DP network by attaching a bus connector to the female 9 pin D-Sub connector on the front of the module.

**Important:** For detailed information on the topology and cabling for line A, refer to the PROFIBUS Standard (DIN 19245 Parts 1 & 3, Issue 1994).

Line B cabling can support baudrates as high as 500k bits/s.

## 4.3 Cabling and Equipment Required for Line B Type

### 4.3.1 Cables

You need a shielded twisted pair cable for your cabling (bus segments or drop cables). Any shielded twisted pair cables available on the market can be used to connect your adapter to a PROFIBUS network, however, bus segment cables must contain wire for data ground and a cable braid shield. We recommend Sprecher+Schuh cable as shown in the following table.

### 4.3.2 T-junction Connectors

You need t-junction connectors to connect your droplines to bus segments. You can use any t-junctions available on the market, however, we recommend Sprecher+Schuh connectors as shown in the following table.

### 4.3.3 Termination Blocks

Termination blocks are only needed if the devices on the end of the network do not have built-in terminating resistors. If you must use termination blocks, any termination blocks available on the market can be used, however, we recommend Sprecher+Schuh termination blocks as shown in the following table.

### 4.3.4 Bus Connector

Connect your adapter to the PROFIBUS DP network by attaching a bus connector to the female 9 pin D-Sub connector on the front of the module.

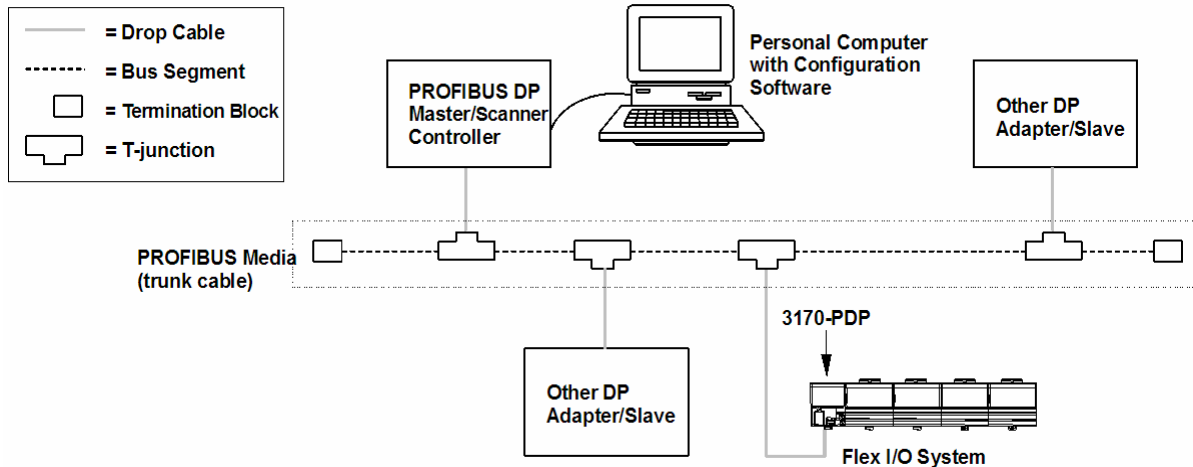
**Important:** For detailed information on the topology and cabling for line B, refer to the PROFIBUS Standard (DIN 19245 Parts 1 & 3, Issue 1994).

Equipment	Type	Catalog Number	Part Number
Drop cable	Sprecher + Schuh	PTL-2, PTL-4, or PDC-10	87.890.282-10
T-junction connector	Sprecher + Schuh	PTS-0	87.890.276-01
Bus segment cable	Sprecher + Schuh	none	299.257.001
Bus segment 1m	Sprecher + Schuh	PCB-10	87.890.281-10
Connector	Sprecher + Schuh	none	87.890.283-01
Termination Block	Sprecher + Schuh	PCE-0	87.890.284-01

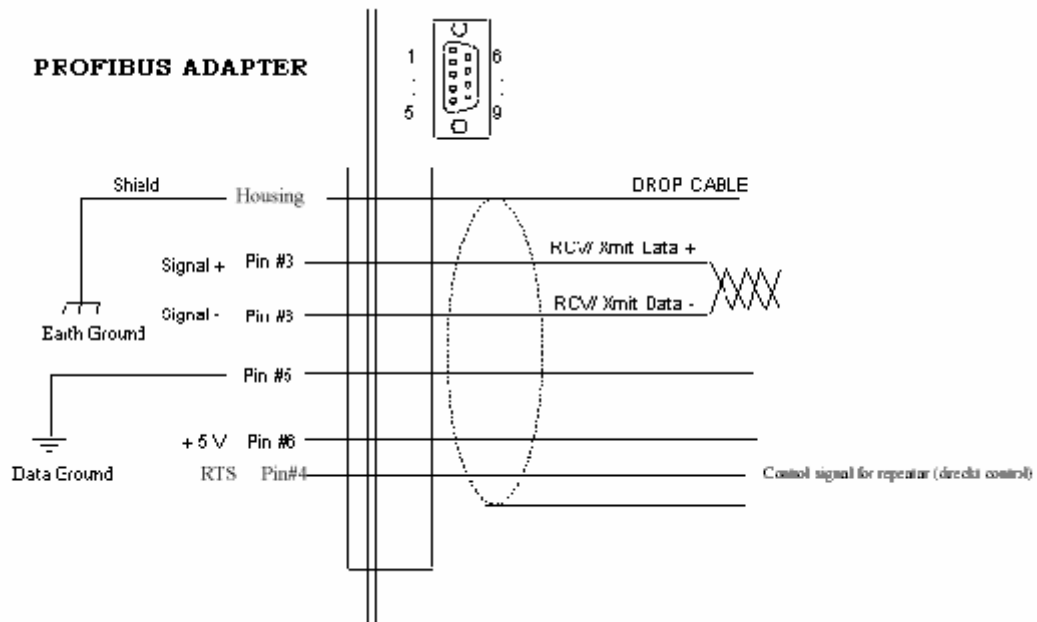
For line A or B connections, use bus segments with t-junctions and termination blocks to form the PROFIBUS media (trunk cable). Use termination blocks to terminate the line at each end of the trunk cable. Use drop cables to connect devices to the network.

#### 4.4 Connect the Adapter to the Network

The maximum number of stations on the same network is 32.



##### 4.4.1 Connect to the Adapter



Connect your drop cable (using either line A or B) to the adapter as shown below:

- 1 Connect the cable shield to the housing of the DSUB. The shield is connected to the FLEX I/O chassis ground.
- 2 Connect the data signal pins on both ends (Signal + Pin #3 and Signal – Pin#8).



- 3 Insert the wired connector into the mating connector on the PROFIBUS adapter.

RTS (Pin 4) Optional pin. Not used in a standard RS455 PROFIBUS – DP installation.

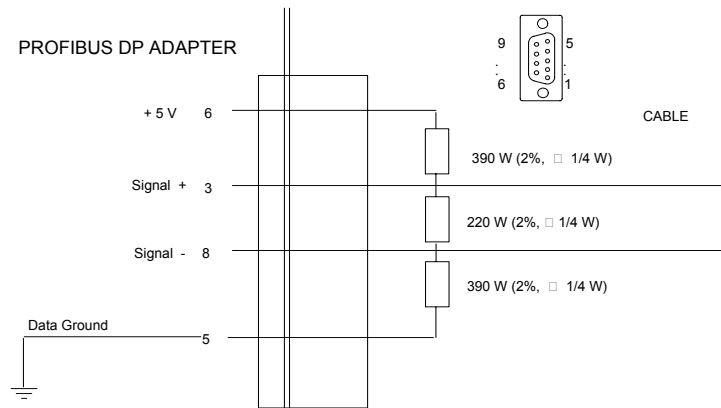
## 4.5 Terminate the Network

You must use termination blocks only if your devices on the end of the network do not have built-in terminating resistors.

Terminate the PROFIBUS media (trunk cable) at both ends of the network. If you are not using a connector with built-in resistors, terminate the cable at the adapter connector as shown below.

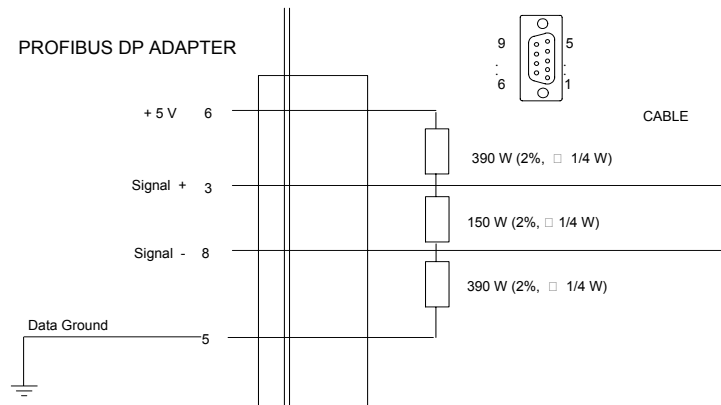
### 4.5.1 Terminate at the Adapter Using Line A

Since Line A has a higher line impedance, you must use the following termination resistors:



### 4.5.2 Terminate at the Adapter Using Line B

Use the following termination resistors with line B:





## 5 Configure the Adapter for Master/Slave Communication

### *In This Chapter*

- How Master/Slave Communication Takes Place..... 51
- Entering User Parameter Data ..... 52
- Read Configuration Response Data..... 60
- Configuration Example Using PROFIBUS Manager Software61

In this chapter, we describe:

- how master/slave communication takes place
- entering user parameter data
- entering check configuration data
- read configuration response data
- a programming configuration example using Rockwell Automation PROFIBUS manager software

A data exchange between the master and slave cannot be performed until check configuration and send parameter data are issued. Each time you power-up the network, the master sends check configuration and send parameter data to the slave (FLEX I/O adapter).

### 5.1 How Master/Slave Communication Takes Place

**Check configuration data** determines or checks the number of input and output words used by each FLEX I/O module.

**Send parameter data** contains device-specific parameters you define for each FLEX I/O module.

You need a **software configuration tool** to set the values associated with these parameters. If you are using the Rockwell Automation 1785-PFB/B coprocessor as a master, you must use the Rockwell Automation PROFIBUS Manager Software configuration tool. Since the FLEX I/O adapter is compatible with any master, you can use any configuration tool available on the market.

The **device database (GSD) file** is included on the software diskette you received with your shipment of the FLEX I/O adapter. The PSFT0882.GSD file is used by your configuration tool to help you set up your system. Your configuration tool automatically reads the PSFT0882.GSD file and extracts defaults used in the data exchange.

The file is in ASCII format and you can view it with any text editor. A printed copy of your PSFT0882.GSD file appears in the Reference chapter.

The user parameter data fields are not defined in the PSFT0882.GSD file. Depending on the format you choose, you may have to manually edit these values with your configuration tool.

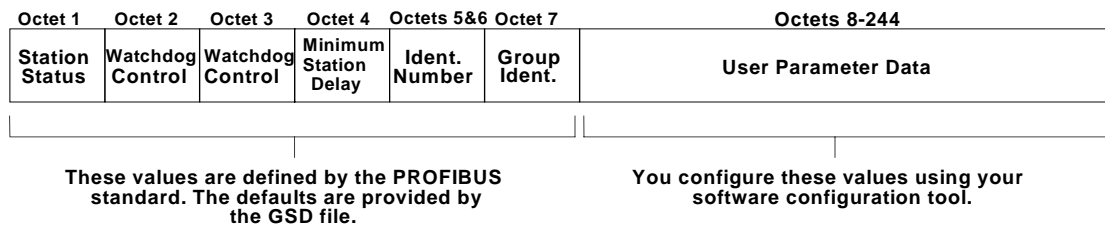
For more information on how you define and enter these user parameter values, refer to the documentation associated with your master and software configuration tool. If you are using the Rockwell Automation 1785-PFB/B Coprocessor master, refer to publications 1785-6.5.15 and 1785-6.5.20.

Send parameter data is comprised of a string of octets that contains 244 bytes of data:

## 5.2 Entering User Parameter Data

- octets 1 to 7 contain data specific to the:
- PROFIBUS standard
- defaults contained in the database (PSFT0882.GSD) file
- octets 8 to 244 are user configurable and contain **user parameter data**. User parameter data consists of these formats:
  - auto configure
  - condensed
  - full

The following illustration shows the structure of the send parameter data table.



### 5.2.1 User Parameter Data

The first byte of the user parameter data is reserved for the SPC3 ASIC. This byte should always be set to 00h

The second byte of the user parameter data is the **flags byte**. This byte selects the appropriate format and also specifies adapter behavior. The flags byte is defined in the following table:

Send Parameter Data Flags Byte		
Bit Position	Name	Description
0 to 1	Format Selection	00 = Auto Configure 01 = Reserved 10 = Condensed 11 = Full

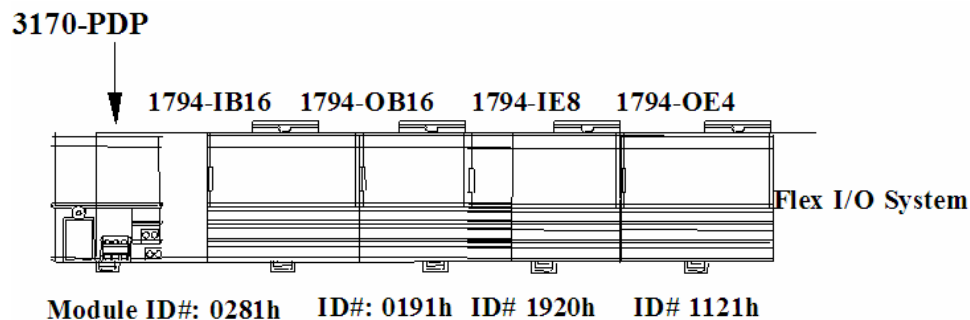
Send Parameter Data Flags Byte		
Bit Position	Name	Description
2 to 3	Fault Action	00 = Reset to zero 01 = Hold Last State 10 = Use Safe State 11 = Reserved
4	Format Selection	0 = Reset inputs to zero 1 = Hold Last Value
5 to 7	Reserved	Reserved bits must be zero

If the send parameter data is received with no user parameter data, the flags byte is set to zero which selects:

- auto configure
- reset outputs to zero on fault
- reset inputs to zero on fault

The reserved bits must be set to zero to prevent undesired firmware update behavior. This is the default behavior of the module as defined in the PSFT0882.GSD file.

The descriptions in this chapter use the following example FLEX I/O configuration to explain the information required for each of these functions:



### 5.2.2 Auto Configure Format

The Auto Configure format allows you to change modules without affecting the User Parameter or Check Configuration data. This format provides no keying from the master on the I/O modules installed in the FLEX I/O system. The installed module at power-up is taken as the key.

If you change a module while it is being controlled by a master, a minor recoverable fault will occur. To recover from this fault, you must replace the module with an identical module type.

User Parameter Example

User Parameter Message, Auto Configure Format

Name	Value	Description
Octet 8:	00h	Reserved.
Octet 9:	00h	Auto Configure Format, Reset to Zero on Fault
Octet10 to 244	00h	Not used

**5.2.3 Condensed Format**

The condensed format consists of the flags byte and the module key parameter for each of the eight slots. This parameter dictates which I/O module must be installed. If at any time the actual module ID does not match this module key, the slot will be considered in fault and the following occurs:

- STATUS LED flashes red/off
- an error bit in the poll response data is set
- a diagnostic bit in the Ext\_Diag\_Data field returned in the Read DP-Slave Diagnostic Information message response is set

All eight slots must be configured. The condensed format structure must be repeated for each of the eight slots.

**Data format for Condensed Format**

Name	Size	Description
Module Key	WORD	Module ID # that must be installed <sup>1</sup>

<sup>1</sup> Only bits 0 to 12 are used. Bits 13 to 15 must be zero except when keying an empty slot where 0FFFFh is used.

The following table shows the identification numbers for current FLEX I/O modules.

FLEX I/O Module Catalog Number	Module Identification Number (module key)
<b>Four-word Modules</b>	
1794-IB16	0281h
1794-OB16	0191h
1794-IA8	0285h
1794IA8I	0280h
1794-OA8	0195h
1794-IB8S	0289h
1794-OW8	0199h
1794IA16	0209h
1794OA8I	019Ch
1794OA16	010Dh
1794IM8	0205h
1794OM8	0105h
1794IB8	0180h
1794IV16	0204h
1794OB8	0190h

<b>FLEX I/O Module Catalog Number</b>	<b>Module Identification Number (module key)</b>
<b>Four-word Modules</b>	
1794OB16P	0108h
1794OV16	0104h
1794OV16P	0109h
1794OB8EP	019Dh
1794IBIOXOB6	0100h
1794IC16	0208h
1794OC16	010Ch
1793IB4	020Ch
1793OB4P	0110h
1793IB2XOB2P	0111h
1793OW4	0115h
<b>Sixteen-word Modules</b>	
1794-IE8/A	1920h
1794-OE4/A	1121h
1794- IE4XOE2/A	1522h
1794-IT8	1B00h
1794-IR8	1B01h
1794-IE8/B	1924h
1794-OE4/B	1125h
1794-IE4XOE2/B	1526h
1293-FM1	1600h
1794IF4I	1720h
1794OF4I	1621h
1794IF2XOF2I	1722h
1794IRT8	1B03h
1794IJ2	1701h
1794ID2	1800h
1794IP4	1A00h
1793IE4	1960h
1793OE2	1161h
1793IE2XOE1	1562h

When you use the condensed format, no safe state data can be defined, thus the safe state data is left at the power up default of all zeroes. Setting the Fault Action in the byte to Use Safe State with this format is the equivalent of setting Reset to Zero.

#### **User Parameter Example**

User Parameter Message, Condensed Format

Name	Value	Description
Octet 8:	00h	Reserved
Octet 9:	02h	Condensed Format, Reset to Zero on Fault, Rest Inputs to Zero

**User Parameter Example**

Octet 10 to 11:	0281h	1794-IB16 16-point discrete input module
Octet 12 to 13:	0191h	1794-OB16 16-point discrete output module
Octet 14 to 15:	1920h	1794-IE8 8-point analog input module
Octet 16 to 17:	1121h	1794-OE4 4-point analog output module
Octet 18 to 19:	0FFFFh	Empty
Octet 20 to 21:	0FFFFh	Empty
Octet 22 to 23:	0FFFFh	Empty
Octet 24 to 25:	0FFFFh	Empty
Octet 26 to 244	00h	Not used

Refer to the configuration example to understand how and where to enter this data.

**Full Format**

The full format consists of the flags byte and four parameters for each of the eight slots. The module key parameter is the same for the full format as defined by the condensed format, but adds three more parameters for each slot.

Use the full format to:

- provide Safe State values for output points
- send FLEX I/O module configurations once (when you send parameters) instead of every poll

configure data sizes to reduce the size of data required during run mode You must configure all eight slots.

**Data format for Full Format**

Name	Size	Description
Module Key	WORD	Module ID that must be installed <sup>1</sup>
Module Data Sizes <sup>2</sup>	BYTE	Bits 0 to 3 Safe State Size (in words) Bits 4 to 7 Config Size (in words)
Safe State Data	ARRAY	Output Safe States. Word array of size Safe State Size.
Module Configuration Data	ARRAY	Flex Module Configuration. Word array of size Config Size.

<sup>1</sup> Only bits 0 to 12 are used. Bits 13 to 15 must be zero except when keying an empty slot where 0FFFFh is used.

<sup>2</sup> Each of the two sizes can range from 0 to 15 words but when combined cannot exceed 15 words total.

There are some possible configurations of FLEX I/O modules that would exceed the user parameter area of 237 bytes. Be aware of the totals of the words and modules you are using.

**User Parameter Example**

**User Parameter Message, Full Format**

Name	Value	Description
Octet 8:	00h	Reserved



User Parameter Message, Full Format		
Name	Value	Description
Octet 9:	0Bh	Full Format, Use Safestate
Octet 10 to 11:	0281h	Slot 1 Module Key 1794-IB16 16-point discrete input module
Octet 12 to 13	10h	Slot 1 config size 1 word, safe state size 0 words
Octet 13 to 14:	0000h	1 config word, input delay times
Octet 15 to 16:	0191h	Slot 2 Module Key 1794-OB16 16-point discrete output module
Octet 17:	01h	Slot 2 config size 0 words, safe state size 1 word
Octet 18 to 19:	0000h	1 safe state data word, safe state value for output points
Octet 20 to 21:	1920h	Slot 3 Module Key 1794-IE8 8-point analog input module
Octet 22:	10h	Slot 3 config size 1 word, safe state size 0 words
Octet 23 to 24:	0000h	1 config word, channel selection
Octet 25 to 26:	5121h	Slot 4 Module Key 1794-OE4 4-point analog output module
Octet 27:	24h	Slot 4 config size 2 words, safe state size 4 words
Octet 28 to 29:	0000h	4 safe state data words – safe state value for output point 1 output point 2 output point 3 output point 4
Octet 30 to 31:	0000h	
Octet 32 to 33:	0000h	
Octet 34 to 35:	0000h	
Octet 36 to 37:	0000h	2 config words – channel selection and output enable
Octet 38 to 39:	0000h	
Octet 40 to 41:	0FFFFh	Slot 5 empty
Octet 42:	00h	Slot 5 all sizes zero
Octet 43 to 44:	0FFFFh	Slot 6 empty
Octet 45:	00h	Slot 6 all sizes zero
Octet 46 to 47:	0FFFFh	Slot 7 empty
Octet 48:	00h	Slot 7 all sizes zero
Octet 49 to 50:	0FFFFh	Slot 8 Empty
Octet 51:	00h	Slot 8 all sizes zero
Octet 52 to 244	00h	Not Used

Refer to the configuration example to understand how and where to enter this data. On a PROFIBUS DP network, the I/O data exchanged between the PROFIBUS DP master and a DP slave is encapsulated into **logical modules**. The total I/O data exchanged between a PROFIBUS DP master and a DP slave device comprises a set of logical modules which is defined in the check configuration data.

### 5.2.4 Entering Check Configuration Data

Each physical slot of the FLEX I/O system is represented by two logical modules (one input and one output). When the FLEX I/O adapter is powered-up, the check configuration message configures the module format (input and output words) and defines the size of the modules within the device. When the sizes are configured, the I/O data can be optimized to remove unused data from the data stream.

Both input and output sizes can be configured. If a slot is empty, or if either the input or output module is zero length, the specific identifier for an empty module (free place) must be used.

If the end of the identifiers is reached before all slots have been configured, the remaining slots are configured as empty.

The first two modules allocated are for the adapter itself, and must always be a 1 word input module and a 1 word output module, regardless of what parameter format you choose. The adapter uses these words for adapter status information. Modules for each of the individual slots (FLEX I/O modules) must also follow these word assignments.

The format of the adapter status word is defined in the following table:

---

**Adapter Status Word**

---

Input Status Word

---

Bit Position	Name	Description
0	Address Change	This bit is set when the Node Address switch is changed since power up.
1 to 7	Reserved	Sent as zeroes.
8 to 15	I/O Module Fault1	This bit is set when an error is detected in a slot position (bits 0 to 7 refer to slots 1 to 8)

---

Output Status Word

---

Bit Position	Name	Description
0 to 15	Reserved	Sent as zeroes.

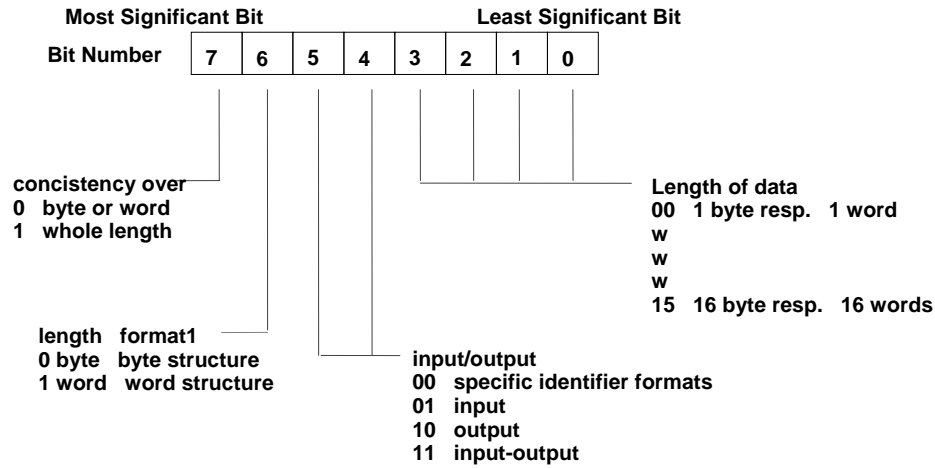
---

1 I/O Module Faults are caused by:

- transmission errors on the FLEX I/O backplane
  - bad module
  - removed module
  - incorrect module inserted
- 

The adapter expects the identifier area for each of the eight FLEX I/O slots to be 2 bytes. The DP input/output identifier and all specific DP identifiers (except the empty module) are not supported.

The identifier byte and its format are described in the following illustration. This byte is defined in Part 3 of the PROFIBUS standard.



1 When transferring words, PROFIBUS DP transfers the high byte first, followed by the low byte. If word structure is entered in the column format the DP master has the possibility to swap the bytes within the word, if required by the target system.

The maximum size of this identifier area is 17 bytes. If no FLEX I/O modules are installed in the upper slots, the length may be less. Consistency must be over a word.

**Check Configuration Example**

**Check Configuration Message when used with Send Parameter Auto Configure or Condensed Format (Length 10 bytes)**

Name	Identifier Byte	Description
Octet 1:	50h	Input Status Word (input – 1 word)
Octet 2:	60h	Output Status Word (output – 1 word)
Octet 3:	50h	Slot 1, input module 1 word
Octet 4:	60h	Slot 1, output module 1 word
Octet 5:	00h	Slot 2, input module empty
Octet 6:	60h	Slot 2, output module 1 word
Octet 7:	58h	Slot 3, input module 9 words
Octet 8:	60h	Slot 3, output module 1 word
Octet 9:	50h	Slot 4, input module empty
Octet 10:	65h	Slot 4, output module 6 words

I/O sizes configured: 22 input bytes, 20 output bytes

Refer to the configuration example to understand how and where to enter this data.

Check Configuration Example

**Check Configuration Message when used with Send Parameter Full Format (Length 10 bytes)**

Name	Identifier Byte	Description
Octet 1:	50h	Status Word (input – 1 word)
Octet 2:	60h	Output Status Word (output – 1 word)
Octet 3:	50h	Slot 1, input module 1 word
Octet 4:	00h	Slot 1, output module empty
Octet 5:	00h	Slot 2, input module empty
Octet 6:	60h	Slot 2, output module 1 word
Octet 7:	58h	Slot 3, input module 9 words
Octet 8:	00h	Slot 3, output module empty
Octet 9:	50h	Slot 4, input module 1 word
Octet 10:	63h	Slot 4, output module 4 words

I/O sizes configured: 24 input bytes, 12 output bytes

The read configuration message response returns the current configuration data. At power up, the configuration is the maximum read and write sizes supported by each FLEX I/O module.

**5.3 Read Configuration Response Data**

A valid check configuration message updates the internal configuration. The updated internal configuration is then returned in the message response.

Power Up Configuration Example

**Read Configuration Message response at Power Up (Length 10 bytes)**

Name	Identifier Byte	Description
Octet 1:	50h	Status Word (input - 1 word)
Octet 2:	60h	Output Status Word (output - 1 word)
Octet 3:	51h	Slot 1, input module 2 words
Octet 4:	60h	Slot 1, output module 1 word
Octet 5:	50h	Slot 2, input module 1 word
Octet 6:	61h	Slot 2, output module 2 words
Octet 7:	58h	Slot 3, input module 9 words
Octet 8:	65h	Slot 3, output module 6 word
Octet 9:	50h	Slot 4, input module 1 word
Octet 10:	60h	Slot 4, output module 14 words

Refer to the configuration example to understand how and where to enter this data. If you are using the Rockwell Automation PROFIBUS Manager configuration software, follow this example to understand how to access and enter data. This example is a User Parameter Message, Full Format.

## 5.4 Configuration Example Using PROFIBUS Manager Software

For more detailed information on configuring your network, refer to your PROFIBUS Manager User Manual, publication 1785-6.5.20.

If you are using another configuration tool, how you access and enter data is similar, however, refer to the user documentation supplied with that tool.

The directions in this example assume you have the software installed and have constructed a DP network containing at least one 3170-PDP FLEX I/O PROFIBUS adapter module.

### User Parameter Example

<b>User Parameter Message, Full Format</b>		
Name	Value	Description
Octet 8:	00h	Reserved
Octet 9:	0Bh	Full Format, Use safe state
Octet 10 to 11:	0281h	Slot 1 Module Key 1794-IB16 16-point discrete input module
Octet 12:	10h	Slot 1 config size 1 word, safe state size 0 words
Octet 13 to 14:	0000h	1 config word, input delay times
Octet 15 to 16:	0191h	Slot 2 Module Key 1794-OB16 16-point discrete output module
Octet 17:	01h	Slot 2 config size 0 words, safe state size 1 word
Octet 18 to 19:	0000h	1 safe state data word, safe state value for output points
Octet 20 to 21:	1920h	Slot 3 Module Key 1794-IE8 8-point analog input module
Octet 22:	10h	Slot 3 config size 1 word, safe state size 0 words
Octet 23 to 24:	0000h	1 config word, channel selection
Octet 25 to 26:	5121h	Slot 4 Module Key 1794-OE4 4-point analog output module
Octet 27:	24h	Slot 4 config size 2 words, safe state size 4 words
Octet 28 to 29:	0000h	4 safe state data words – safe state value for output point 1 output point 2 output point 3 output point 4
Octet 30 to 31:	0000h	
Octet 32 to 33:	0000h	
Octet 34 to 35:	0000h	
Octet 36 to 37:	0000h	2 config words – channel selection and output enable
Octet 38 to 39:	0000h	
Octet 40 to 41:	0FFFFh	Slot 5 empty
Octet 42:	00h	Slot 5 all sizes zero
Octet 43 to 44:	0FFFFh	Slot 6 empty
Octet 45:	00h	Slot 6 all sizes zero
Octet 46 to 47:	0FFFFh	Slot 7 empty
Octet 48:	00h	Slot 7 all sizes zero
Octet 49 to 50:	0FFFFh	Slot 8 Empty

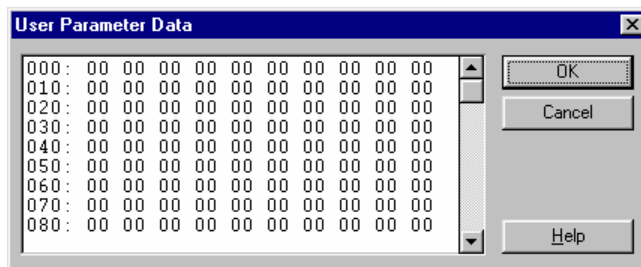
**User Parameter Message, Full Format**

Name	Value	Description
Octet 51:	00h	Slot 8 all sizes zero
Octet 52 to 244:	00h	Not used

- 1 In your network, double-click on the slave icon.  
 You see the 3170-PDP Device Parameters screen



You see the User Parameter Data screen:



- 2 Enter the Full Format data values as shown in the User Parameter example:  
 User Parameter Example

**User Parameter Message, Full Format (Length 43 bytes)**

Name	Value	Description
Octet 8	00h	Reserved
Octet 9:	0Bh	Full Format, Use safe state
Octet 10 to 11:	0281h	Slot 1 Module Key 1794-IB16 16-point discrete input module
Octet 12:	10h	Slot 1 config size 1 word, safe state size 0 words
Octet 13 to 14:	0000h	1 config word, input delay times
Octet 15 to 16:	0191h	Slot 2 Module Key 1794-OB16 16-point discrete output module
Octet 17:	01h	Slot 2 config size 0 words, safe state size 1 word
Octet 18 to 19:	0000h	1 safe state data word, safe state value for output points
Octet 20 to 21:	1920h	Slot 3 Module Key 1794-IE8 8-point analog input module
Octet 22:	10h	Slot 3 config size 1 word, safe state size 0 words
Octet 23 to 24:	0000h	1 config word, channel selection
Octet 25 to 26:	5121h	Slot 4 Module Key 1794-OE4 4-point analog output module
Octet 27:	24h	Slot 4 config size 2 words, safe state size 4 words
Octet 28 to 29:	0000h	2 config words – channel selection and output enable
Octet 30 to 31:	0000h	

User Parameter Message, Full Format (Length 43 bytes)		
Name	Value	Description
Octet 32 to 33:	0000h	4 safe state data words – safe state value for output point 1 output point 2 output point 3 output point 4
Octet 34 to 35:	0000h	
Octet 36 to 37:	0000h	
Octet 38 to 39:	0000h	
Octet 40 to 41:	0FFFFh	Slot 5 empty
Octet 42:	00h	Slot 5 all sizes zero
Octet 43 to 44:	0FFFFh	Slot 6 empty
Octet 45:	00h	Slot 6 all sizes zero
Octet 46 to 47:	0FFFFh	Slot 7 empty
Octet 48:	00h	Slot 7 all sizes zero
Octet 49 to 50:	0FFFFh	Slot 8 Empty
Octet 51:	00h	Slot 8 all sizes zero
Octet 52 to 244	00h	Not Used



After you enter all octet values, click



In the 3170-PDP Device Parameters screen, click

You see the Modules Information screen:

Select each of the possible modules in the Possible Modules column, then click



on . Repeat this for the four FLEX I/O modules in the example. Also add 3170-PDP Status (counts as one module) and three Flex I/O empty slot modules. All eight slots must be accounted for.

Index	I/O	Length	Byte/Word	Sync/Async
0	In	9	words	Sync
1	Out	1	word	Sync

Notice as you add each module, the **Module Configuration** status appears:

If you want to edit the configuration of a module, select the module and click on



After you account for all module slots in the example, the **Modules Information** screen should look similar to this:

This picture is  
unavailable at this time.

For more detailed information on configuring your network, refer to your PROFIBUS Manager User Manual, publication 1785-6.5.20.



## 6 Troubleshooting

### *In This Chapter*

- What this Chapter Contains ..... 65
- Troubleshooting with the Indicators..... 65
- Configuration differences between 1794-APB and 3170-PDP.67

### 6.1 What this Chapter Contains

In this chapter, we describe how to use the adapter's indicators for troubleshooting.

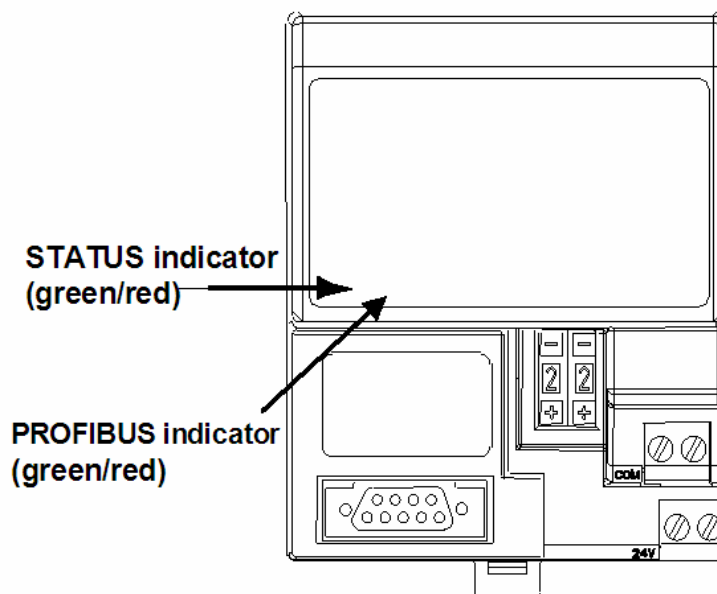
It also describes some issues that has to be taken in consideration when replacing the Rockwell Automation 1794-APB with a 3170-PDP adapter.

Locate the two bi-color indicators on the front panel of the adapter. They show both normal operation and fault conditions in your Flex I/O PROFIBUS system. The indicators are:

### 6.2 Troubleshooting with the Indicators

- STATUS - this indicator provides device status

PROFIBUS - this indicator provides communication link status Use the following table to determine the indicator conditions and status.



**STATUS Indicator**

Indication	Status
OFF	No power
Solid Green	Normal operation
Flashing Red/OFF	Recoverable fault - Flex I/O module bad - Incorrect Flex I/O module installed - Node address changed since power up
Solid Red	Unrecoverable fault

**PROFIBUS Indicator**

Indication	Status
OFF	No power or no communication
Solid Green	Data is being transmitted and received
Flashing Red/OFF	Recoverable fault - Invalid Send Parameter data1 - Invalid Check Configuration data 2
Solid Red	Unrecoverable fault - Unable to communicate

- <sup>1</sup> If invalid send Parameter is received, check that:
  - The Flag byte (octet 9) contains a Valid mode selection (00h, 10h or 11h).
  - The spc3 related byte (octet 8) equals 00h.
- <sup>2</sup> If invalid Check Configuration data is received, check that the number of models in the slave configuration data equals nine. (one adapter status module + one module for each slot)

You can use read diagnostics to view status using the master's configuration software. The adapter returns identification in response to the Read DP-Slave Diagnostic Information message.

Viewing Status from the Master's Configuration Software Read DP-Slave Diagnostics Information

**Message**

Ext_Diag_Data field (Length 9 bytes)	
Octet	Description
7	Device Related diagnostic header byte (05h)
8	Revision - Minor
9	Revision - Major
10	Adapter Status Bit 0 - Node Address Changed Bits 1 to 7 - Reserved
11	Node Address switch setting
12	Identifier Related diagnostic header byte (44h)
13 to 15	Identifier diagnostic bits1

**Message**

1 One identifier bit for each logical module (adapter and each slot use two identifier bits). The bits set indicate a module fault. For example down below.

Example: If the modules in slot 3 and 6 are faulty, byte 13 to 15 will look like this.

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 13	1	1	0	0	0	0	1	1
Description	slot 3		slot 2		slot 1		Adapter	
Byte 14	0	0	1	1	0	0	0	0
Description	slot 7		slot 6		slot 5		slot 4	
Byte 15	x	x	x	x	x	x	0	0
Description	not used		not used		not used		slot 8	

**6.3 Configuration differences between 1794-APB and 3170-PDP.**

There are two things that must be taken in consideration when replacing the AB adapter with HMS adapter. These items are further described in this document.

**1 PSFT0882.GSD file:**

The 1794-APB has a Rockwell GSD file with a Rockwell "PROFIBUS Ident Number" (stating Rockwell as manufactor among other things).

The 3170-PDP has a PSFT0882.GSD file with a "PROFIBUS Ident Number" (stating PROSOFT TECHNOLOGY, INC. as manufacturer among other things).

For a new customer this does not make any difference, he just use the PSFT0882.GSD file instead of the old Rockwell GSD file when installing the unit.

For a customer already using 1794-APB and need a replacement unit, this will generate some extra work for that user. The adapter is fully replaceable, but if a replacement of the adapter is done, the PROFIBUS Master is still configured with the Rockwell GSD file. The 3170-PDP only responds to the PSFT0882.GSD file, which means that the Rockwell GSD file must also be replaced, otherwise network communication will not start.

You must start up the PROFIBUS Configurator and replace the Rockwell GSD file with the PSFT0882.GSD file.

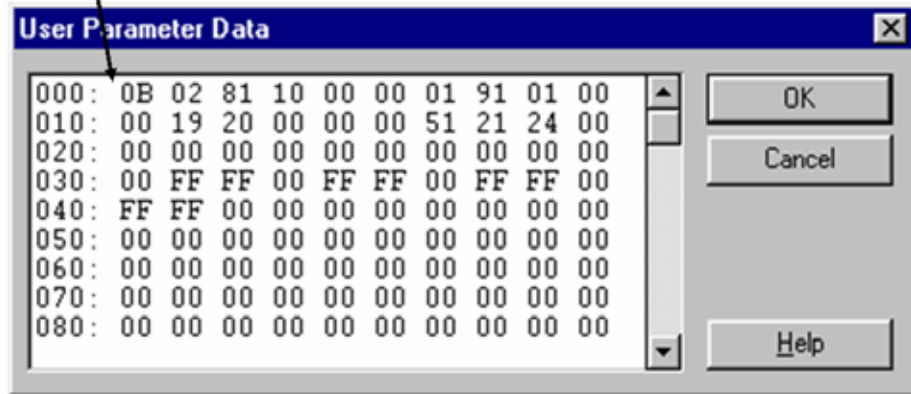
**2 User parameter data:**

One extra byte of user parameter data has to be added to the parameterization string. This extra byte is needed for the 12Mbit ASIC on board. The user has to add this extra byte in the first position of the user parameter data string. An example of the adapter configured in Full Format for the different adapters are shown below. Figure 1 shows the configuration for 1794-APB, figure 2 shows the same configuration, but for 3170-PDP.

Note that one byte(00h) has to be placed before the Flag byte when 3170-PDP is used!

### 6.3.1 User parameter data for 1794-APB:

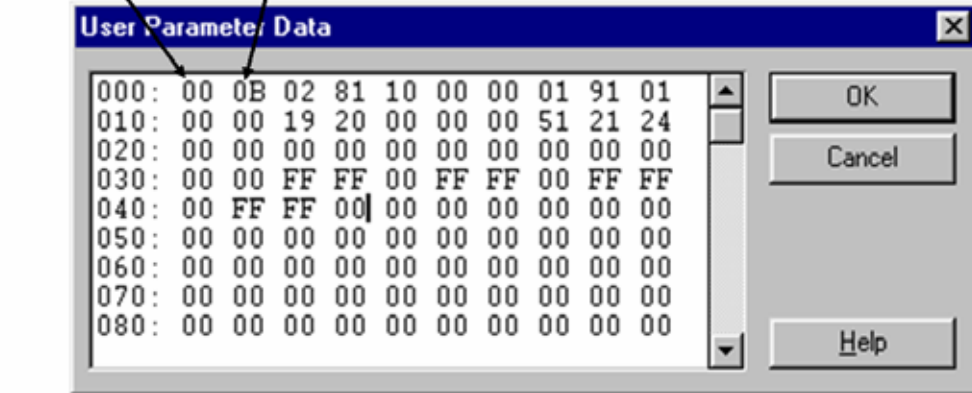
1:st byte = Flag byte



### 6.3.2 User parameter data for 3170-PDP:

1:st byte = 00h

2:nd byte = Flag byte



## 7 Reference

### *In This Chapter*

- Product Specifications..... 69
- Device Data Base File..... 70

### 7.1 Product Specifications

---

#### **3170-PDP Flex I/O PROFIBUS Adapter Specifications**

I/O Capacity	8 modules
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	All rates up to 12 Mbit/s
Indicators	STATUS LED - red/grn PROFIBUS LED - red/grn
Flexbus Output Current	640mA maximum @ 5V dc
Power Consumption	400mA maximum from external 24V dc supply
Power Dissipation	7.68W maximum @ 19.2V dc
Environmental Conditions	
Operational Temperature	0 to 55°C (32 to 122°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
PROFIBUS Connector	9-pin D-shell
PROFIBUS Drop Cable	Standard Drop Cable
Power Conductors	
Wire Size	12 gauge (4mm <sup>2</sup> ) stranded maximum
Category	3/64 inch (1.2mm) insulation max. 21
Agency Certification	• PNO
(when product or packaging is marked)	• CE marked for all applicable directives

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."

---

## 7.2 Device Data Base File

This chapter contains an example of the device data base (PSFT0882.GSD) file for the 3170-PDP.

This file is included on the software diskette you received with your shipment of the FLEX I/O adapter. The PSFT0882.GSD file is used by your configuration tool to help you set up your system. Your configuration tool automatically reads the PSFT0882.GSD file and extracts defaults used in the data exchange.

The file is in ASCII format and you can view it with any text editor. A printed copy of your PSFT0882.GSD file appears below.

This device data base file changes when new FLEX I/O modules are introduced. When you add new modules to your system, contact your local Rockwell Automation representative for the latest version of this file.

```

;=====
; Profibus Device Database of:
; ProSoft Technology Inc. DP slave
; Model: 3170-PDP
; Description: Flex I/O Profibus adapter
; Language: English
; Date: 10 April 2007
; Author: ProSoft Technology Inc.
;=====
#Profibus_DP
GSD_Revision = 2
; Device identification
Vendor_Name = " ProSoft Technology Inc "
Model_Name = " 3170-PDP "
Revision = " Version 2.2 "
Ident_Number = 0x0882
Protocol_Ident = 0 ; DP protocol
Station_Type = 0 ; Slave device
FMS_supp = 0 ; FMS not supported
Hardware_Release = " Series A "
Software_Release = " Rev. >= 1.6 "

; Supported baudrates
9.6_supp = 1
19.2_supp = 1
45.45_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1

; Maximum responder time for supported baudrates
MaxTsdr_9.6 = 60
MaxTsdr_19.2 = 60
MaxTsdr_45.45 = 250

```

---

```

MaxTsdr_93.75      = 60
MaxTsdr_187.5     = 60
MaxTsdr_500       = 100
MaxTsdr_1.5M     = 150
MaxTsdr_3M       = 250
MaxTsdr_6M       = 450
MaxTsdr_12M      = 800

; Supported hardware features
Redundancy        = 0          ; not supported
Repeater_Ctrl_Sig = 2          ; TTL
24V_Pins         = 0          ; not connected
Implementation_Type = "SPC3"
; Supported DP features
Freeze_Mode_supp = 1          ; supported
Sync_Mode_supp   = 1          ; supported
Auto_Baud_supp   = 1          ; supported
Set_Slave_Add_supp = 0        ; not supported

; Max Length of User Parameter
Max_User_Prm_Data_Len = 237

; Maximum polling frequency
Min_Slave_Intervall = 1        ;100 µs

; Maximum supported sizes
Modular_Station = 1           ; modular
Max_Module      = 9           ; physical modules = slots
Max_Input_Len   = 244
Max_Output_Len  = 244
Max_Data_Len    = 488
Modul_Offset    = 1

Slave_Family    = 3
Max_Diag_Data_Len = 15
; Meaning of "device diagnostic" field
;The first two bytes (corresponding to Unit_Diag_Area = 0-15)
;contains information about the actual firmware version.
;The third byte (corresponding to Unit_Diag_Area = 16-23)
;indicates if the address switch has been altered.
Unit_Diag_Bit (16) = "Node address changed"
;The fourth byte (corresponding to Unit_Diag_Area = 24-31) contains ;the current
setting of the node address switch.
;Please look at the user manual (section "Troubleshooting") for a detailed
;explanation about the meaning of these bytes.

;-----
;Prm-Text-Def-List: The Flag byte
;-----

;Format selection
PrmText = 1
Text(0) = "Auto Configure format"
Text(2) = "Condensed format"
Text(3) = "Full format"
EndPrmText

```

---

```
;Output Fault action
PrmText = 2
Text(0) = "Reset to zero"
Text(1) = "Hold Last State"
Text(2) = "Use Safe State"
EndPrmText

;Input fault action
PrmText = 3
Text(0) = "Reset to zeros"
Text(1) = "Hold Last State"
EndPrmText

;Module specific
PrmText = 4
Text(0) = "8.6 ms / 26.6 ms"
Text(1) = " 9 ms / 27 ms"
Text(2) = "10 ms / 28 ms"
Text(3) = "12 ms / 30 ms"
Text(4) = "17 ms / 35 ms"
Text(5) = "26 ms / 44 ms"
Text(6) = "43 ms / 61 ms"
Text(7) = "78 ms / 96 ms"
EndPrmText

PrmText = 5
Text(0) = "512 us"
Text(1) = "1 ms"
Text(2) = "2 ms"
Text(3) = "4 ms"
Text(4) = "8 ms"
Text(5) = "16 ms"
Text(6) = "32 ms"
Text(7) = "64 ms"
EndPrmText

PrmText = 6
Text(0) = "Disable"
Text(1) = "Enable"
EndPrmText

PrmText = 7
Text(0) = "Degree Celsius"
Text(1) = "Degree Fahrenheit"
Text(2) = "Bipolar"
Text(3) = "Unipolar"
EndPrmText

PrmText = 8
Text(0) = "No enhanced mode"
Text(1) = "Enhanced mode"
EndPrmText

PrmText = 9
Text(0) = "10 Hz"
```



```
Text(1) = "25 Hz"
Text(2) = "50 Hz"
Text(3) = "60 Hz"
Text(4) = "100 Hz"
Text(5) = "250 Hz"
Text(6) = "500 Hz"
Text(7) = "1000 Hz"
EndPrmText

PrmText = 10
Text(0) = "Resistance"
Text(1) = "No sensor connected"
Text(2) = "100 ohm Pt a = 0.00385 Euro"
Text(3) = "100 ohm Pt a = 0.003916 US"
Text(4) = "200 ohm Pt a = 0.00385"
Text(5) = "500 ohm Pt a = 0.00385"
Text(7) = "10 ohm copper"
Text(8) = "120 ohm nickel"
Text(9) = "100 ohm nickel"
Text(10) = "200 ohm nickel"
Text(11) = "500 ohm nickel"
Text(12) = "Module data time stamp"
EndPrmText

PrmText = 11
Text(0) = "Software digital filter disabled"
Text(1) = "Software digital filter enabled"
EndPrmText

PrmText = 12
Text(0) = "Millivolts"
Text(1) = "B 300 to 1800 C"
Text(2) = "E -270 to 1000 C"
Text(3) = "J -210 to 1200 C"
Text(4) = "K -71 to 1372 C"
Text(5) = "R -50 to 1768 C"
Text(6) = "S -50 to 1768 C"
Text(7) = "T -73 to 400 C"
Text(8) = "C 0 to 2315 C"
Text(9) = "N -270 to 1300 C"
Text(12) = "Rep cold temp for channels 0-3"
Text(13) = "Rep cold temp for channels 4-7"
EndPrmText

PrmText = 13
Text(0) = "7.5 ms / 26.5 ms"
Text(1) = "8 ms / 27 ms"
Text(2) = "9 ms / 28 ms"
Text(3) = "10 ms / 29 ms"
Text(4) = "12 ms / 31 ms"
Text(5) = "16 ms / 35 ms"
Text(6) = "24.5 ms / 44 ms"
Text(7) = "42 ms / 60.5 ms"
EndPrmText

PrmText = 14
Text(0) = "256 us"
```

```
Text(1) = "512 us"  
Text(2) = "1 ms"  
Text(3) = "2 ms"  
Text(4) = "4 ms"  
Text(5) = "8 ms"  
Text(6) = "16 ms"  
Text(7) = "32 ms"  
EndPrmText
```

```
PrmText = 15  
Text(0) = "No reset"  
Text(1) = "Reset"  
EndPrmText
```

```
PrmText = 16  
Text(0) = "Standard input filtered data"  
Text(1) = "Fast input"  
EndPrmText
```

```
PrmText = 17  
Text(0) = "0.25 ms"  
Text(1) = "0.5 ms"  
Text(2) = "1 ms"  
Text(3) = "2 ms"  
Text(4) = "4 ms"  
Text(5) = "8 ms"  
Text(6) = "16 ms"  
Text(7) = "32 ms"  
EndPrmText
```

```
PrmText = 18  
Text(0) = "Use word 6"  
Text(1) = "Use word 0"  
EndPrmText
```

```
PrmText = 19  
Text(0) = "Disabled"  
Text(1) = "Enabled"  
EndPrmText
```

```
PrmText = 20  
Text(0) = "Degree Celsius"  
Text(1) = "Degree Fahrenheit"  
Text(2) = "Degree Kelvin"  
Text(3) = "-32767 to +32767"  
Text(4) = "0 to 65536"  
EndPrmText
```

```
PrmText = 21  
Text(0) = "0 C"  
Text(1) = "20 C"  
Text(2) = "25 C"  
Text(3) = "30 C"  
Text(4) = "40 C"  
Text(5) = "50 C"  
Text(6) = "60 C"  
Text(7) = "70 C"
```

---

EndPrmText

PrmText = 22  
Text(0) = "Hardware filtering only"  
Text(1) = "25 ms"  
Text(2) = "100 ms"  
Text(3) = "250 ms"  
Text(4) = "500 ms"  
Text(5) = "1 s"  
Text(6) = "2 s"  
Text(7) = "5 s"  
EndPrmText

PrmText = 23  
Text(0) = "Thermocouple"  
Text(1) = "RTD"  
EndPrmText

PrmText = 24  
Text(0) = "Ext comp/2-wire, no comp"  
Text(1) = "Int comp/2-wire, user sel comp"  
Text(2) = "No comp/3-wire RTD"  
Text(3) = "Diff measure 2 ch/4-wire RTD"  
EndPrmText

PrmText = 25  
Text(0) = "Resistance/mV"  
Text(1) = "100 ohm -200 - 870C/300 - 1800C"  
Text(2) = "200 ohm -200 - 400C/-270 - 1000C"  
Text(3) = "100 ohm -200 - 630C/-210 - 1200C"  
Text(4) = "100 ohm -200 - 400C/-270 - 1372C"  
Text(5) = "100 ohm nickel/-200 - 800C"  
Text(6) = "200 ohm nickel/-270 - 1300C"  
Text(7) = "120 ohm nickel/-50 - 1768C"  
Text(8) = "10 ohm copper/-50 - 1768C"  
Text(9) = "--/-270 - 400C"  
EndPrmText

PrmText = 26  
Text(0) = "0 ohm"  
Text(1) = "5 ohm"  
Text(2) = "10 ohm"  
Text(3) = "15 ohm"  
EndPrmText

PrmText = 27  
Text(0) = "1 - 32767"  
Text(1) = "1.0 - 3276.7"  
EndPrmText

PrmText = 28  
Text(0) = "Use minimum sampling time"  
Text(1) = "2"  
Text(2) = "4"  
Text(3) = "8"  
Text(4) = "16"  
Text(5) = "32"

---

```
Text(6) = "64"  
Text(7) = "128"  
EndPrmText  
  
PrmText = 29  
Text(0) = "No multiplier"  
Text(1) = "X2"  
Text(2) = "X4"  
Text(3) = "X32"  
EndPrmText  
  
PrmText = 30  
Text(0) = "Safe state act by bus comm"  
Text(1) = "Safe state act by any failure"  
EndPrmText  
  
PrmText = 31  
Text(0) = "Reset outputs"  
Text(1) = "Hold last state"  
EndPrmText  
  
PrmText = 32  
Text(0) = "Disabled"  
Text(1) = "Alarm only(frequency unchanged)"  
Text(2) = "Alarm and force frequency to max"  
Text(3) = "Alarm and force frequency to min"  
EndPrmText  
  
PrmText = 33  
Text(0) = "No multiplier, alarm immediately"  
Text(1) = "2 sample periods + 2s delay"  
Text(2) = "8 sample periods + 2s delay"  
Text(3) = "32 sample periods + 2s delay"  
EndPrmText  
  
PrmText = 34  
Text(0) = "Frequency alarm"  
Text(1) = "Acceleration alarm"  
EndPrmText  
  
PrmText = 35  
Text(0) = "Rolling average"  
Text(1) = "8"  
Text(2) = "16"  
Text(3) = "32"  
EndPrmText  
  
PrmText = 36  
Text(0) = "Normal run mode"  
Text(1) = "Startup mode"  
EndPrmText  
  
PrmText = 37  
Text(0) = "2"  
Text(1) = "4"  
Text(2) = "5"  
Text(3) = "10"
```

```
Text(4) = "20"  
Text(5) = "50"  
Text(6) = "100"  
Text(7) = "200"  
Text(8) = "500"  
Text(9) = "1000"  
EndPrmText  
  
PrmText = 38  
Text(0) = "Normal (Active high, 24V=On)"  
Text(1) = "Invert input (Active low, 0V=On)"  
EndPrmText  
  
PrmText = 39  
Text(0) = "Count on rising edge"  
Text(1) = "Quadrature encoder X1"  
Text(2) = "Quadrature encoder X2"  
Text(3) = "Quadrature encoder X4"  
Text(4) = "Count up sig A, down sig B"  
Text(5) = "No count"  
Text(6) = "No count"  
Text(7) = "No count"  
EndPrmText  
  
PrmText = 40  
Text(0) = "No gate func on input G"  
Text(1) = "Counting if G is high"  
Text(2) = "Counting if G is low"  
Text(3) = "Counter can be cal if G high"  
EndPrmText  
  
PrmText = 41  
Text(0) = "Save counter on pos edge Z"  
Text(1) = "Save counter on pos edge G"  
Text(2) = "Save counter on neg edge G"  
Text(3) = "Save counter on neg & pos edge G"  
EndPrmText  
  
PrmText = 42  
Text(0) = "Pulse counting and period time"  
Text(1) = "Period time"  
EndPrmText  
  
PrmText = 43  
Text(0) = "Period time with 10MHz clock"  
Text(1) = "Period time with 1MHz clock"  
EndPrmText  
  
PrmText = 44  
Text(0) = "1 period"  
Text(1) = "2 periods"  
Text(2) = "4 periods"  
Text(3) = "8 periods"  
Text(4) = "16 periods"  
Text(5) = "32 periods"  
Text(6) = "64 periods"  
Text(7) = "128 periods"
```

---

EndPrmText

; Bentley Nevada specific

PrmText = 46

Text(0) = "0-3 mils"

Text(1) = "0-5 mils"

Text(2) = "0-10 mils"

Text(3) = "0-15 mils"

Text(4) = "0-20 mils"

Text(5) = "0-100 um"

Text(6) = "0-125 um"

Text(7) = "0-150 um"

Text(8) = "0-200 um"

Text(9) = "0-250 um"

Text(10) = "0-300 um"

Text(11) = "0-400 um"

Text(12) = "0-500 um"

EndPrmText

PrmText = 47

Text(0) = "4 Hz"

Text(1) = "1 Hz"

EndPrmText

PrmText = 48

Text(0) = "4000 Hz"

Text(1) = "600 Hz"

EndPrmText

PrmText = 49

Text(0) = "0.15 s"

Text(1) = "0.20 s"

Text(2) = "0.30 s"

Text(3) = "0.50 s"

Text(4) = "0.60 s"

Text(5) = "1.00 s"

Text(6) = "2.00 s"

Text(7) = "3.00 s"

Text(8) = "5.00 s"

Text(9) = "6.00 s"

Text(10) = "10.00 s"

Text(11) = "20.00 s"

EndPrmText

PrmText = 50

Text(0) = "Normal operation"

Text(1) = "Reset"

EndPrmText

PrmText = 51

Text(0) = "None"

Text(1) = "Internal galvanic isolator"

Text(2) = "External zener barrier"

Text(3) = "External galvanic isolator"

EndPrmText

```
PrmText = 52
Text(0) = "Monitor will not accept conf"
Text(1) = "Normal operation mode"
EndPrmText

PrmText = 53
Text(0) = "None"
Text(1) = "1.5"
Text(2) = "2.0"
Text(3) = "3.0"
EndPrmText

PrmText = 54
Text(0) = "Not active"
Text(1) = "Active"
EndPrmText

PrmText = 56
Text(0) = "Thrust direction towards probe"
Text(1) = "Thrust direction away from probe"
EndPrmText

PrmText = 58
Text(0) = "0-0.5 in/s pk"
Text(1) = "0-1.0 in/s pk"
Text(2) = "0-2.0 in/s pk"
Text(8) = "0-10 mm/s pk"
Text(9) = "0-20 mm/s pk"
Text(10) = "0-50 mm/s pk"
Text(16) = "0-5 mils pp, integrated vel"
Text(17) = "0-10 mils pp, integrated vel"
Text(18) = "0-20 mils pp, integrated vel"
Text(24) = "0-100 um pp, integrated vel"
Text(25) = "0-200 um pp, integrated vel"
Text(26) = "0-500 um pp, integrated vel"
Text(32) = "0-0.5 in/s rms"
Text(33) = "0-1.0 in/s rms"
Text(34) = "0-2.0 in/s rms"
Text(40) = "0-10 mm/s rms"
Text(41) = "0-20 mm/s rms"
Text(42) = "0-40 mm/s rms"
Text(43) = "0-50 mm/s rms"
EndPrmText

PrmText = 59
Text(0) = "TOK off"
Text(1) = "TOK on"
EndPrmText

PrmText = 60
Text(0) = "3 Hz"
Text(1) = "10 Hz"
Text(2) = "15 Hz"
Text(3) = "18 Hz"
Text(4) = "20 Hz"
Text(5) = "25 Hz"
Text(6) = "30 Hz"
```

```
Text(7) = "50 Hz"  
Text(8) = "60 Hz"  
Text(9) = "80 Hz"  
Text(10) = "100 Hz"  
Text(11) = "120 Hz"  
Text(12) = "110 Hz"  
EndPrmText
```

```
PrmText = 61  
Text(0) = "5500 Hz"  
Text(1) = "4000 Hz"  
Text(2) = "3000 Hz"  
Text(3) = "2000 Hz"  
Text(4) = "1600 Hz"  
Text(5) = "1400 Hz"  
Text(6) = "1200 Hz"  
Text(7) = "1000 Hz"  
Text(8) = "800 Hz"  
Text(9) = "600 Hz"  
Text(10) = "400 Hz"  
Text(11) = "200 Hz"  
Text(12) = "120 Hz"  
Text(13) = "100 Hz"  
Text(14) = "450 Hz"  
EndPrmText
```

```
PrmText = 63  
Text(0) = "0-2 gs pk"  
Text(1) = "0-5 gs pk"  
Text(2) = "0-10 gs pk"  
Text(3) = "0-20 gs pk"  
Text(4) = "0-25 gs pk"  
Text(5) = "0-40 gs pk"  
Text(6) = "0-50 gs pk"  
Text(8) = "0-20 m/s2 pk"  
Text(9) = "0-50 m/s2 pk"  
Text(10) = "0-100 m/s2 pk"  
Text(11) = "0-200 m/s2 pk"  
Text(12) = "0-250 m/s2 pk"  
Text(13) = "0-400 m/s2 pk"  
Text(14) = "0-500 m/s2 pk"  
Text(16) = "0-1.0 in/s, int acc"  
Text(17) = "0-2.0 in/s, int acc"  
Text(24) = "0-25 mm/s pk, int acc"  
Text(25) = "0-50 mm/s pk, int acc"  
Text(26) = "0-100 mm/s pk, int acc"  
Text(32) = "0-2 gs rms acc"  
Text(33) = "0-5 gs rms acc"  
Text(34) = "0-10 gs rms acc"  
Text(35) = "0-20 gs rms acc"  
Text(36) = "0-25 gs rms acc"  
Text(37) = "0-40 gs rms acc"  
Text(38) = "0-50 gs rms acc"  
Text(40) = "0-20 m/s2 rms acc"  
Text(41) = "0-50 m/s2 rms acc"  
Text(42) = "0-100 m/s2 rms acc"  
Text(43) = "0-200 m/s2 rms acc"
```



```

Text(44) = "0-250 m/s2 rms acc"
Text(45) = "0-400 m/s2 rms acc"
Text(46) = "0-500 m/s2 rms acc"
Text(48) = "0-1.0 in/s rms, int rms acc"
Text(49) = "0-2.0 in/s rms, int rms acc"
Text(56) = "0-25 mm/s rms, int rms acc"
Text(57) = "0-50 mm/s rms, int rms acc"
Text(58) = "0-100 mm/s rms, int rms acc"
EndPrmText

PrmText = 64
Text(1) = "Dual accel, 14.05 kHz"
Text(2) = "Dual accel, 31.55 kHz"
Text(3) = "Single channel accel, 23.4 kHz"
EndPrmText

PrmText = 65
Text(1) = "01"
EndPrmText

PrmText = 66
Text(0) = "73.5kHz or min 0.007ms pulsewidth"
Text(1) = "37.8kHz or min 0.013ms pulsewidth"
Text(2) = "12.8kHz or min 0.04ms pulsewidth"
Text(3) = "1.2kHz or min 0.4ms pulsewidth"
EndPrmText

;=====
;End of all the Text string definitions.

ExtUserPrmData = 1 "Format Selection"
BitArea(0-1) 0 0,2,3
Prm_Text_Ref = 1
EndExtUserPrmData

ExtUserPrmData = 2 "Output Fault Action"
BitArea(2-3) 0 0-2
Prm_Text_Ref = 2
EndExtUserPrmData

ExtUserPrmData = 3 "Input Fault Action"
Bit(4) 0 0-1
Prm_Text_Ref = 3
EndExtUserPrmData

ExtUserPrmData = 4 "Input delay time"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 4
EndExtUserPrmData

ExtUserPrmData = 5 "Delay Time for Inputs 00-11"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 5
EndExtUserPrmData

ExtUserPrmData = 6 "Delay Time for Inputs 12-15"

```

```
BitArea(3-5) 0 0-7
Prm_Text_Ref = 5
EndExtUserPrmData

ExtUserPrmData = 7 "Safe state value word 0"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 8 "Safe state value word 1"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 9 "Safe state value word 2"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 10 "Safe state value word 3"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 11 "Range selection"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 12 "Channel 0 output"
Bit(0) 1 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 13 "Channel 1 output"
Bit(1) 1 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 14 "Channel 2 output"
Bit(2) 1 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 15 "Channel 3 output"
Bit(3) 1 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 16 "Safe state value byte"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 17 "Calibration mask"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 18 "Module data type"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 7
EndExtUserPrmData
```

```
ExtUserPrmData = 19 "Enhanced mode select"
Bit(2) 0 0-1
Prm_Text_Ref = 8
EndExtUserPrmData

ExtUserPrmData = 20 "A/D filter first notch frequency"
BitArea(3-5) 0 0-7
Prm_Text_Ref = 9
EndExtUserPrmData

ExtUserPrmData = 21 "Channel 0 RTD type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 22 "Channel 1 RTD type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 23 "Channel 2 RTD type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 24 "Channel 3 RTD type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 25 "Channel 4 RTD type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 26 "Channel 5 RTD type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 27 "Channel 6 RTD type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 28 "Channel 7 RTD type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 10
EndExtUserPrmData

ExtUserPrmData = 29 "Fixed digital filter"
Bit(2) 0 0-1
Prm_Text_Ref = 11
EndExtUserPrmData

ExtUserPrmData = 30 "Channel 0 Thermocouple type"
BitArea(0-3) 0 0-15
```

---

```
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 31 "Channel 1 Thermocouple type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 32 "Channel 2 Thermocouple type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 33 "Channel 3 Thermocouple type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 34 "Channel 4 Thermocouple type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 35 "Channel 5 Thermocouple type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 36 "Channel 6 Thermocouple type"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 37 "Channel 7 Thermocouple type"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 12
EndExtUserPrmData

ExtUserPrmData = 38 "Input delay time"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 5
EndExtUserPrmData

ExtUserPrmData = 39 "Delay time input 0-11"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 13
EndExtUserPrmData

ExtUserPrmData = 40 "Delay time input 12-15"
BitArea(3-5) 0 0-7
Prm_Text_Ref = 13
EndExtUserPrmData

ExtUserPrmData = 41 "Delay time input"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 13
EndExtUserPrmData
```

```
ExtUserPrmData = 42 "Filter time for inputs"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 14
EndExtUserPrmData

ExtUserPrmData = 43 "Counter reset"
Bit(4) 0 0-1
Prm_Text_Ref = 15
EndExtUserPrmData

ExtUserPrmData = 44 "Counter fast"
Bit(5) 0 0-1
Prm_Text_Ref = 16
EndExtUserPrmData

ExtUserPrmData = 45 "Input filter time, 0-9/11"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 17
EndExtUserPrmData

ExtUserPrmData = 46 "Input filter time, 12-15"
BitArea(3-5) 0 0-7
Prm_Text_Ref = 17
EndExtUserPrmData

ExtUserPrmData = 47 "Delay Time for Inputs 0-3"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 5
EndExtUserPrmData

ExtUserPrmData = 48 "Safe state, 4 bits"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 49 "Safe state, 2 bits"
BitArea(0-1) 0 0-3
EndExtUserPrmData

ExtUserPrmData = 50 "Delay Time for Inputs 0-1"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 5
EndExtUserPrmData

ExtUserPrmData = 51 "Full range bits"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 52 "Configure select bits"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmdata = 53 "Multiplex control bits"
BitArea(0-1) 0 0-3
EndExtUserPrmData

ExtUserPrmdata = 54 "Configure select bits"
```

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```
BitArea(0-1) 0 0-3
EndExtUserPrmData

ExtUserPrmdata = 55 "Full range bits"
BitArea(0-1) 0 0-3
EndExtUserPrmData

ExtUserPrmData = 56 "Multiplex control bit"
Bit(0) 0 0-1
Prm_Text_Ref = 18
EndExtUserPrmData

ExtUserPrmdata = 57 "Configure select bits"
BitArea(0-4) 0 0-31
EndExtUserPrmData

ExtUserPrmdata = 58 "Full range bits"
BitArea(0-4) 0 0-31
EndExtUserPrmData

ExtUserPrmdata = 59 "Channel 3,2,1,0 filter"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmdata = 60 "Channel 3,2,1,0 configuration"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmdata = 61 "Real time sample interval"
Unsigned16 0 0-32767
EndExtUserPrmData

ExtUserPrmData = 62 "Initiate configuration"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 63 "Transparent bit"
Bit(5) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 64 "Interrupt toggle bit"
Bit(4) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 65 "Revert to defaults"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 66 "Quick calibration"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData
```

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```
ExtUserPrmData = 67 "Calibration clock"
Bit(5) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 68 "Gain offset select"
Bit(4) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 69 "Channel 0"
Bit(0) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 70 "Channel 1"
Bit(1) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 71 "Channel 2"
Bit(2) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 72 "Channel 3"
Bit(3) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 73 "One"
Bit(6) 1 1-1
EndExtUserPrmData

ExtUserPrmData = 74 "Outputs to hold, Channel 0"
Bit(0) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 75 "Outputs to hold, Channel 1"
Bit(1) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 76 "Outputs to hold, Channel 2"
Bit(2) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 77 "Outputs to hold, Channel 3"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 78 "Input channel 1 filter"
BitArea(4-7) 0 0-15
EndExtUserPrmData
```

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```
ExtUserPrmData = 79 "Input channel 0 filter"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 80 "Output channel 1 configuration"
BitArea(4-7) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 81 "Output channel 0 configuration"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 82 "Input channel 1 configuration"
BitArea(4-7) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 83 "Input channel 0 configuration"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 84 "Input Channel 0"
Bit(0) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 85 "Input Channel 1"
Bit(1) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 86 "Output Channel 0"
Bit(2) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 87 "Output Channel 1"
Bit(3) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 88 "Outputs to hold, Channel 1"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 89 "Outputs to hold, Channel 0"
Bit(2) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 90 "Calibration"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 91 "Calibration clock"
```



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```
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 92 "Data format for all channels"
BitArea(0-3) 0 0-4
Prm_Text_Ref = 20
EndExtUserPrmData

ExtUserPrmData = 93 "Fault mode channels 4-7"
Bit(7) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 94 "Fault mode channels 0-3"
Bit(6) 1 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 95 "Reference junction selection"
BitArea(3-5) 0 0-7
Prm_Text_Ref = 21
EndExtUserPrmData

ExtUserPrmData = 96 "Filter cut-off"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 22
EndExtUserPrmData

ExtUserPrmData = 97 "Input type sel ch 4-7"
BitArea(6-7) 0 0-1
Prm_Text_Ref = 23
EndExtUserPrmData

ExtUserPrmData = 98 "Input type sel ch 0-3"
BitArea(6-7) 0 0-1
Prm_Text_Ref = 23
EndExtUserPrmData

ExtUserPrmData = 99 "Sensor mode ch 4-7 Thermo/RTD"
BitArea(4-5) 0 0-3
Prm_Text_Ref = 24
EndExtUserPrmData

ExtUserPrmData = 100 "Sensor mode ch 0-3 Thermo/RTD"
BitArea(4-5) 0 0-3
Prm_Text_Ref = 24
EndExtUserPrmData

ExtUserPrmData = 101 "Sensor type ch 4-7 RTD/Thermo"
BitArea(0-3) 0 0-9
Prm_Text_Ref = 25
EndExtUserPrmData

ExtUserPrmData = 102 "Sensor type ch 0-3 RTD/Thermo"
BitArea(0-3) 0 0-9
Prm_Text_Ref = 25
```

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```
EndExtUserPrmData

ExtUserPrmData = 103 "RTD offset Channel 7"
BitArea(6-7) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 104 "RTD offset Channel 6"
BitArea(4-5) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 105 "RTD offset Channel 5"
BitArea(2-3) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 106 "RTD offset Channel 4"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 107 "RTD offset Channel 3"
BitArea(6-7) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 108 "RTD offset Channel 2"
BitArea(4-5) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 109 "RTD offset Channel 1"
BitArea(2-3) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmData = 110 "RTD offset Channel 0"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 26
EndExtUserPrmData

ExtUserPrmdata = 111 "EDT command word"
Unsigned16 0 0-32767
EndExtUserPrmData

ExtUserPrmData = 112 "Communication fault"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 113 "Safe state mode"
Bit(6) 0 0-1
Prm_Text_Ref = 31
EndExtUserPrmData

ExtUserPrmData = 114 "Frequency range Ch 0"
```

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```
Bit(5) 0 0-1
Prm_Text_Ref = 27
EndExtUserPrmData

ExtUserPrmData = 115 "Frequency range Ch 1"
Bit(5) 0 0-1
Prm_Text_Ref = 27
EndExtUserPrmData

ExtUserPrmData = 116 "Pulses to terminate sampl, Ch 0"
BitArea(2-4) 0 0-7
Prm_Text_Ref = 28
EndExtUserPrmData

ExtUserPrmData = 117 "Pulses to terminate sampl, Ch 1"
BitArea(2-4) 0 0-7
Prm_Text_Ref = 28
EndExtUserPrmData

ExtUserPrmData = 118 "Missing pulse multiplier, Ch 0"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 29
EndExtUserPrmData

ExtUserPrmData = 119 "Missing pulse multiplier, Ch 1"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 29
EndExtUserPrmData

ExtUserPrmData = 120 "Local fault mode"
Bit(6) 0 0-1
Prm_Text_Ref = 30
EndExtUserPrmData

ExtUserPrmData = 121 "Maximum frequency Ch 0"
Unsigned16 0 0-32767
EndExtUserPrmData

ExtUserPrmData = 122 "Maximum frequency Ch 1"
Unsigned16 0 0-32767
EndExtUserPrmData

ExtUserPrmData = 123 "Freq scaling multiplier Ch 0"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 124 "Freq scaling multiplier Ch 1"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 125 "Wire off fault sel GI, Ch 0"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 126 "Wire off fault sel GI, Ch 1"
Bit(7) 0 0-1
```

```
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 127 "Wire off fault sel FI, Ch 0"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 128 "Wire off fault sel FI, Ch 1"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 129 "Invert select GI, Ch 0"
Bit(5) 0 0-1
Prm_Text_Ref = 38
EndExtUserPrmData

ExtUserPrmData = 130 "Invert select GI, Ch 1"
Bit(5) 0 0-1
Prm_Text_Ref = 38
EndExtUserPrmData

ExtUserPrmData = 131 "Invert select FI, Ch 0"
Bit(4) 0 0-1
Prm_Text_Ref = 38
EndExtUserPrmData

ExtUserPrmData = 132 "Invert select FI, Ch 1"
Bit(4) 0 0-1
Prm_Text_Ref = 38
EndExtUserPrmData

ExtUserPrmData = 133 "Min freq sampling time, Ch 0"
BitArea(0-3) 0 0-9
Prm_Text_Ref = 37
EndExtUserPrmData

ExtUserPrmData = 134 "Min freq sampling time, Ch 1"
BitArea(0-3) 0 0-9
Prm_Text_Ref = 37
EndExtUserPrmData

ExtUserPrmData = 135 "Initiate startup select, Ch 0"
Bit(7) 0 0-1
Prm_Text_Ref = 36
EndExtUserPrmData

ExtUserPrmData = 136 "Initiate startup select, Ch 1"
Bit(7) 0 0-1
Prm_Text_Ref = 36
EndExtUserPrmData

ExtUserPrmData = 137 "Acceleration calc time, Ch 0"
BitArea(5-6) 0 0-3
Prm_Text_Ref = 35
EndExtUserPrmData
```

```
ExtUserPrmData = 138 "Acceleration calc time, Ch 1"  
BitArea(5-6) 0 0-3  
Prm_Text_Ref = 35  
EndExtUserPrmData  
  
ExtUserPrmData = 139 "Freq/Acc alarm select, Ch 0"  
Bit(4) 0 0-1  
Prm_Text_Ref = 34  
EndExtUserPrmData  
  
ExtUserPrmData = 140 "Freq/Acc alarm select, Ch 1"  
Bit(4) 0 0-1  
Prm_Text_Ref = 34  
EndExtUserPrmData  
  
ExtUserPrmData = 141 "Missing pulse delay mult, Ch 0"  
BitArea(2-3) 0 0-3  
Prm_Text_Ref = 33  
EndExtUserPrmData  
  
ExtUserPrmData = 142 "Missing pulse delay mult, Ch 1"  
BitArea(2-3) 0 0-3  
Prm_Text_Ref = 33  
EndExtUserPrmData  
  
ExtUserPrmData = 143 "Wire off/Missing pulse, Ch 0"  
BitArea(0-1) 0 0-3  
Prm_Text_Ref = 32  
EndExtUserPrmData  
  
ExtUserPrmData = 144 "Wire off/Missing pulse, Ch 1"  
BitArea(0-1) 0 0-3  
Prm_Text_Ref = 32  
EndExtUserPrmData  
  
ExtUserPrmData = 145 "Preset reset, CW0"  
Bit(7) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData  
  
ExtUserPrmData = 146 "Store reset, CW0"  
Bit(6) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData  
  
ExtUserPrmData = 147 "Rollover, CW0"  
Bit(5) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData  
  
ExtUserPrmData = 148 "Store control, CW0"  
BitArea(3-4) 0 0-3  
Prm_Text_Ref = 41  
EndExtUserPrmData  
  
ExtUserPrmData = 149 "Gate control, CW0"
```

```
BitArea(1-2) 0 0-3
Prm_Text_Ref = 40
EndExtUserPrmData

ExtUserPrmData = 150 "Cal cntrl, Reset, CW0"
Bit(0) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 151 "Cal cntrl, Direction, CW0"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 152 "Cal cntrl, Enable, CW0"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 153 "Count enable, CW0"
Bit(5) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 154 "Enable Z preset, CW0"
Bit(4) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 155 "Preset bit, CW0"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 156 "Mode selection, CW0"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 39
EndExtUserPrmData

ExtUserPrmData = 157 "Preset reset, CW1"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 158 "Store reset, CW1"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 159 "Rollover, CW1"
Bit(5) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 160 "Store control, CW1"
BitArea(3-4) 0 0-3
Prm_Text_Ref = 41
```

```
EndExtUserPrmData

ExtUserPrmData = 161 "Gate control, CW1"
BitArea(1-2) 0 0-3
Prm_Text_Ref = 40
EndExtUserPrmData

ExtUserPrmData = 162 "Cal cntrl, Reset, CW1"
Bit(0) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 163 "Cal cntrl, Direction, CW1"
Bit(7) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 164 "Cal cntrl, Enable, CW1"
Bit(6) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 165 "Count enable, CW1"
Bit(5) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 166 "Enable Z preset, CW1"
Bit(4) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 167 "Preset bit, CW1"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 168 "Mode selection, CW1"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 39
EndExtUserPrmData

ExtUserPrmData = 169 "Channel 0 Preset"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 170 "Channel 1 Preset"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 171 "Pulse/period measurement, Ch 3"
Bit(3) 0 0-1
Prm_Text_Ref = 42
EndExtUserPrmData

ExtUserPrmData = 172 "Pulse/period measurement, Ch 2"
Bit(2) 0 0-1
```

```
Prm_Text_Ref = 42
EndExtUserPrmData

ExtUserPrmData = 173 "Pulse/period measurement, Ch 1"
Bit(1) 0 0-1
Prm_Text_Ref = 42
EndExtUserPrmData

ExtUserPrmData = 174 "Pulse/period measurement, Ch 0"
Bit(0) 0 0-1
Prm_Text_Ref = 42
EndExtUserPrmData

ExtUserPrmData = 175 "Period nr selection, Ch 3"
BitArea(5-7) 0 0-7
Prm_Text_Ref = 44
EndExtUserPrmData

ExtUserPrmData = 176 "Clock freq for period time, Ch 3"
Bit(4) 0 0-1
Prm_Text_Ref = 43
EndExtUserPrmData

ExtUserPrmData = 177 "Period nr selection, Ch 2"
BitArea(1-3) 0 0-7
Prm_Text_Ref = 44
EndExtUserPrmData

ExtUserPrmData = 178 "Clock freq for period time, Ch 2"
Bit(0) 0 0-1
Prm_Text_Ref = 43
EndExtUserPrmData

ExtUserPrmData = 179 "Period nr selection, Ch 1"
BitArea(5-7) 0 0-7
Prm_Text_Ref = 44
EndExtUserPrmData

ExtUserPrmData = 180 "Clock freq for period time, Ch 1"
Bit(4) 0 0-1
Prm_Text_Ref = 43
EndExtUserPrmData

ExtUserPrmData = 181 "Period nr selection, Ch 0"
BitArea(1-3) 0 0-7
Prm_Text_Ref = 44
EndExtUserPrmData

ExtUserPrmData = 182 "Clock freq for period time, Ch 0"
Bit(0) 0 0-1
Prm_Text_Ref = 43
EndExtUserPrmData

ExtUserPrmData = 183 "Start new measurement, Ch 3"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData
```



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```
ExtUserPrmData = 184 "Start new measurement, Ch 2"  
Bit(2) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData
```

```
ExtUserPrmData = 185 "Start new measurement, Ch 1"  
Bit(1) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData
```

```
ExtUserPrmData = 186 "Start new measurement, Ch 0"  
Bit(0) 0 0-1  
Prm_Text_Ref = 19  
EndExtUserPrmData
```

```
ExtUserPrmData = 187 "CHA Transduc type & Scale factor"  
Unsigned16 0 0-65535  
EndExtUserPrmData
```

```
ExtUserPrmData = 188 "CHB Transduc type & Scale factor"  
Unsigned16 0 0-65535  
EndExtUserPrmData
```

```
ExtUserPrmData = 191 "CHA Full scale range"  
BitArea(4-7) 0 0-15  
Prm_Text_Ref = 46  
EndExtUserPrmData
```

```
ExtUserPrmData = 192 "CHB Full scale range"  
BitArea(4-7) 0 0-15  
Prm_Text_Ref = 46  
EndExtUserPrmData
```

```
ExtUserPrmData = 193 "CHA Over alarm gap setpoint"  
BitArea(0-7) 0 0-240  
EndExtUserPrmData
```

```
ExtUserPrmData = 194 "CHA Under alarm gap setpoint"  
BitArea(0-7) 0 0-240  
EndExtUserPrmData
```

```
ExtUserPrmData = 195 "CHB Over alarm gap setpoint"  
BitArea(0-7) 0 0-240  
EndExtUserPrmData
```

```
ExtUserPrmData = 196 "CHB Under alarm gap setpoint"  
BitArea(0-7) 0 0-240  
EndExtUserPrmData
```

```
ExtUserPrmData = 197 "CHA Danger setpoint"  
BitArea(0-7) 0 0-200  
EndExtUserPrmData
```

```
ExtUserPrmData = 198 "CHA Alert setpoint"  
BitArea(0-7) 0 0-200  
EndExtUserPrmData
```

```
ExtUserPrmData = 199 "CHB Danger setpoint"  
BitArea(0-7) 0 0-200  
EndExtUserPrmData  
  
ExtUserPrmData = 200 "CHB Alert setpoint"  
BitArea(0-7) 0 0-200  
EndExtUserPrmData  
  
ExtUserPrmData = 201 "CHA HP Corner"  
BitArea(4-7) 0 0-13  
Prm_Text_Ref = 47  
EndExtUserPrmData  
  
ExtUserPrmData = 202 "CHA LP Corner"  
BitArea(0-3) 0 0-13  
Prm_Text_Ref = 48  
EndExtUserPrmData  
  
ExtUserPrmData = 203 "CHB HP Corner"  
BitArea(4-7) 0 0-13  
Prm_Text_Ref = 47  
EndExtUserPrmData  
  
ExtUserPrmData = 204 "CHB LP Corner"  
BitArea(0-3) 0 0-13  
Prm_Text_Ref = 48  
EndExtUserPrmData  
  
ExtUserPrmData = 205 "CHA Danger time delay"  
BitArea(4-7) 0 0-15  
Prm_Text_Ref = 49  
EndExtUserPrmData  
  
ExtUserPrmData = 206 "CHA Alert time delay"  
BitArea(0-3) 0 0-15  
Prm_Text_Ref = 49  
EndExtUserPrmData  
  
ExtUserPrmData = 207 "CHB Danger time delay"  
BitArea(4-7) 0 0-15  
Prm_Text_Ref = 49  
EndExtUserPrmData  
  
ExtUserPrmData = 208 "CHB Alert time delay"  
BitArea(0-3) 0 0-15  
Prm_Text_Ref = 49  
EndExtUserPrmData  
  
ExtUserPrmData = 209 "Monitor reset"  
Bit(7) 0 0-1  
Prm_Text_Ref = 50  
EndExtUserPrmData  
  
ExtUserPrmData = 210 "Barrier Configuration"  
BitArea(5-6) 0 0-3  
Prm_Text_Ref = 51
```

```
EndExtUserPrmData

ExtUserPrmData = 211 "Set configuration flag"
Bit(4) 0 0-1
Prm_Text_Ref = 52
EndExtUserPrmData

ExtUserPrmData = 212 "Channel A"
Bit(1) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 213 "Channel B"
Bit(0) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 214 "CHA Trip multiply"
BitArea(6-7) 0 0-3
Prm_Text_Ref = 53
EndExtUserPrmData

ExtUserPrmData = 215 "CHB Trip multiply"
BitArea(4-5) 0 0-3
Prm_Text_Ref = 53
EndExtUserPrmData

ExtUserPrmData = 216 "CHA trip multiply enable"
Bit(3) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 217 "CHB trip multiply enable"
Bit(2) 0 0-1
Prm_Text_Ref = 19
EndExtUserPrmData

ExtUserPrmData = 218 "CHA Inhibit"
Bit(1) 0 0-1
Prm_Text_Ref = 54
EndExtUserPrmData

ExtUserPrmData = 219 "CHB Inhibit"
Bit(0) 0 0-1
Prm_Text_Ref = 54
EndExtUserPrmData

ExtUserPrmData = 222 "CHA Full scale range & Zero pos"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 223 "CHB Full scale range & Zero pos"
Unsigned16 0 0-65535
EndExtUserPrmData

ExtUserPrmData = 224 "CHA Direct over danger setpoint"
Unsigned8 0 0-200
```

```
EndExtUserPrmData

ExtUserPrmData = 225 "CHA Direct under danger setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 226 "CHA Direct over alert setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 227 "CHA Direct under alert setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 228 "CHB Direct over Danger setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 229 "CHB Direct under Danger setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 230 "CHB Direct over alert setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 231 "CHB Direct under alert setpoint"
Unsigned8 0 0-200
EndExtUserPrmData

ExtUserPrmData = 232 "CHA Upscale thrust direction"
Bit(3) 0 0-1
Prm_Text_Ref = 56
EndExtUserPrmData

ExtUserPrmData = 233 "CHB Upscale thrust direction"
Bit(2) 0 0-1
Prm_Text_Ref = 56
EndExtUserPrmData

ExtUserPrmData = 236 "CHA Full scale range"
BitArea(2-7) 0 0-63
Prm_Text_Ref = 58
EndExtUserPrmData

ExtUserPrmData = 237 "CHB Full scale range"
BitArea(2-7) 0 0-63
Prm_Text_Ref = 58
EndExtUserPrmData

ExtUserPrmData = 238 "CHA TOK"
Bit(1) 0 0-1
Prm_Text_Ref = 59
EndExtUserPrmData

ExtUserPrmData = 239 "CHB TOK"
Bit(1) 0 0-1
```

```
Prm_Text_Ref = 59
EndExtUserPrmData

ExtUserPrmData = 240 "CHA HP corner"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 60
EndExtUserPrmData

ExtUserPrmData = 241 "CHA LP corner"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 61
EndExtUserPrmData

ExtUserPrmData = 242 "CHB HP corner"
BitArea(4-7) 0 0-15
Prm_Text_Ref = 60
EndExtUserPrmData

ExtUserPrmData = 243 "CHB LP corner"
BitArea(0-3) 0 0-15
Prm_Text_Ref = 61
EndExtUserPrmData

ExtUserPrmdata = 246 "CHA Full scale range"
BitArea(2-7) 0 0-63
Prm_Text_Ref = 63
EndExtUserPrmData

ExtUserPrmData = 247 "CHB Full scale range"
BitArea(2-7) 0 0-63
Prm_Text_Ref = 63
EndExtUserPrmData

ExtuserPrmData = 248 "CHA HP corner, see table"
BitArea(4-7) 0 0-15
EndExtUserPrmData

ExtuserPrmData = 249 "CHA LP corner, see table"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtuserPrmData = 250 "CHB HP corner, see table"
BitArea(4-7) 0 0-15
EndExtUserPrmData

ExtUserPrmData = 251 "CHB LP corner, see table"
BitArea(0-3) 0 0-15
EndExtUserPrmData

ExtUserPrmdata = 252 "Monitor type selection"
BitArea(2-3) 1 1-3
Prm_Text_Ref = 64
EndExtUserPrmdata

ExtUserPrmData = 253 "Monitor type selection"
BitArea(2-3) 1 1-1
Prm_Text_Ref = 65
```

```

EndExtUserPrmData

ExtUserPrmData = 254 "Freq scaling divisor Ch 0"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 255 "Freq scaling divisor Ch 1"
Unsigned8 0 0-255
EndExtUserPrmData

ExtUserPrmData = 256 "Filter constants"
BitArea(0-2) 0 0-7
Prm_Text_Ref = 17
EndExtUserPrmData

ExtUserPrmData = 257 "Filter A0 enable"
Bit(0) 0 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 258 "Filter A1 enable"
Bit(1) 0 0-1
Prm_Text_Ref = 6
EndExtUserPrmData

ExtUserPrmData = 259 "Filter Constant"
BitArea(0-1) 0 0-3
Prm_Text_Ref = 66
EndExtUserPrmData

;-----
;Autoconfigure
;-----

Ext_User_Prm_Data_Const(0) = 0x00
Ext_User_Prm_Data_Ref(1) = 1
Ext_User_Prm_Data_Ref(1) = 2
Ext_User_Prm_Data_Ref(1) = 3

; Definition of all available physical modules
;=====

; Flex I/O adapter status (must be the first module in config, 1 word in, 1 word
out)
Module = "3170-PDP Status" 0x50, 0x60
EndModule

; Definition of modules for autoconfigure
;=====

; Empty slot for Flex I/O (2 configuration bytes per slot)
Module = "Flex I/O empty slot/Auto format" 0x00, 0x00
EndModule
; AC Modules
;-----

```

---

```
; Flex I/O module 1794-IA8, (default config= 1 word in, 1 word out)
Module = "1794-IA8 / Auto format"    0x50, 0x60
EndModule

; Flex I/O module 1794-IA8I, (default config= 1 word in, 1 word out)
Module = "1794-IA8I / Auto format"    0x50, 0x60
EndModule

; Flex I/O module 1794-IA16, (default config= 2 word in, 1 word out)
Module = "1794-IA16 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1794-OA8, (default config= 0 word in, 1 word out)
Module = "1794-OA8 / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1794-OA8I, (default config= 0 word in, 1 word out)
Module = "1794-OA8I / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1794-OA16, (default config= 1 word in, 1 word out)
Module = "1794-OA16 / Auto format"    0x50, 0x61
EndModule

; Flex I/O module 1794-IM8, (default config= 2 word in, 1 word out)
Module = "1794-IM8 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1794-OM8, (default config= 1 word in, 1 word out)
Module = "1794-OM8 / Auto format"    0x50, 0x61
EndModule

; DC Modules
;-----

; Flex I/O module 1794-IB8, (default config= 2 word in, 1 word out)
Module = "1794-IB8 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1794-IB8S, (default config= 1 word in, 1 word out)
Module = "1794-IB8S / Auto format"    0x50, 0x60
EndModule

; Flex I/O module 1794-IB16, (default config= 2 word in, 1 word out)
Module = "1794-IB16 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1793-IB16/A, S/A, (default config= 2 word in, 1 word out)
Module = "1793-IB16/A, S/A / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1794-IV16, (default config= 2 word in, 1 word out)
Module = "1794-IV16 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1793-IV16/A, S/A, (default config= 2 word in, 1 word out)
```

```
Module = "1793-IV16/A, S/A / Auto format"    0x51, 0x60
EndModule
; Flex I/O module 1794-OB8, (default config= 0 word in, 1 word out)
Module = "1794-OB8 / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1794-OB16, (default config= 0 word in, 1 word out)
Module = "1794-OB16 / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1794-OB16P, (default config= 0 word in, 1 word out)
Module = "1794-OB16P / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1793-OB16P/A, S/A, (default config= 0 word in, 1 word out)
Module = "1793-OB16P/A, S/A / Auto format"    0x00, 0x60
EndModule
; Flex I/O module 1794-OV16, (default config= 0 word in, 1 word out)
Module = "1794-OV16 / Auto format"    0x00, 0x61
EndModule

; Flex I/O module 1794-OV16P, (default config= 0 word in, 1 word out)
Module = "1794-OV16P / Auto format"    0x00, 0x60
EndModule

; Flex I/O module 1793-OV16P/A, S/A, (default config= 0 word in, 1 word out)
Module = "1793-OV16P/A, S/A / Auto format"    0x00, 0x60
EndModule
; Flex I/O module 1794-OB8EP, (default config= 1 word in, 2 word out)
Module = "1794-OB8EP / Auto format"    0x50, 0x61
EndModule

; Flex I/O module 1794-IB10XOB6, (default config= 1 word in, 2 word out)
Module = "1794-IB10XOB6 / Auto format"    0x50, 0x61
EndModule
; Flex I/O module 1794-IC16, (default config= 2 word in, 1 word out)
Module = "1794-IC16 / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1794-OC16, (default config= 1 word in, 1 word out)
Module = "1794-OC16 / Auto format"    0x50, 0x61
EndModule

; Flex I/O module 1793-IB4(S), (default config= 2 word in, 1 word out)
Module = "1793-IB4(S) / Auto format"    0x51, 0x60
EndModule

; Flex I/O module 1793-OB4P(S), (default config= 0 word in, 1 word out)
Module = "1793-OB4P(S) / Auto format"    0x00, 0x60
EndModule
; Flex I/O module 1793-IB2XOB2P(S), (default config= 1 word in, 2 word out)
Module = "1793-IB2XOB2P(S) / Auto format"    0x50, 0x61
EndModule
; Flex I/O module 1794-IB32/A, (default config= 2 word in, 1 word out)
Module = "1794-IB32 / Auto format"    0x51, 0x60
EndModule
```



---

```
; Flex I/O module 1794-OB32P, (default config= 0 word in, 2 word out)
Module = "1794-OB32P / Auto format" 0x00, 0x61
EndModule

; Flex I/O module 1794-IB16XOB16P, (default config= 1 word in, 2 word out)
Module = "1794-IB16XOB16P / Auto format" 0x50, 0x61
EndModule

; Analog Modules
;-----

; Flex I/O module 1794-IE8, (default config= 9 words in, 1 word out)
Module = "1794-IE8 / Auto format" 0x58, 0x60
EndModule

; Flex I/O module 1794-OE4, (default config= 1 word in, 6 words out)
Module = "1794-OE4 / Auto format" 0x50, 0x65
EndModule

; Flex I/O module 1794-IE4XOE2, (default config= 5 words in, 4 words out)
Module = "1794-IE4XOE2 / Auto format" 0x54, 0x63
EndModule
; Flex I/O module 1793-IE4(S), (default config= 9 words in, 1 word out)
Module = "1793-IE4(S) / Auto format" 0x58, 0x60
EndModule

; Flex I/O module 1793-OE2(S), (default config= 1 word in, 6 words out)
Module = "1793-OE2(S) / Auto format" 0x50, 0x65
EndModule

; Flex I/O module 1793-IE2XOE1(S), (default config= 5 words in, 4 words out)
Module = "1793-IE2XOE1(S) / Auto format" 0x54, 0x63
EndModule

; Isolated Analog Modules
;-----

; Flex I/O module 1794-IF4I, (default config= 7 words in, 5 words out)
Module = "1794-IF4I / Auto format" 0x56, 0x64
EndModule

; Flex I/O module 1794-OF4I, (default config= 6 words in, 7 words out)
Module = "1794-OF4I / Auto format" 0x55, 0x66
EndModule

; Flex I/O module 1794-IF2XOF2I, (default config= 7 words in, 7 words out)
Module = "1794-IF2XOF2I / Auto format" 0x56, 0x66
EndModule
; Relay Modules
;-----

; Flex I/O module 1794-OW8, (default config= 0 word in, 1 word out)
Module = "1794-OW8 / Auto format" 0x00, 0x60
EndModule

; Flex I/O module 1793-OW4(S), (default config= 0 word in, 1 word out)
Module = "1793-OW4(S) / Auto format" 0x00, 0x60
```

---

```
EndModule

; Special Modules
;-----

; Flex I/O module 1794-IR8, (default config= 11 words in, 3 words out)
Module = "1794-IR8 / Auto format"    0x5A, 0x62
EndModule

; Flex I/O module 1794-IRT8, (default config= 11 words in, 4 words out)
Module = "1794-IRT8 / Auto format"    0x5A, 0x63
EndModule

; Flex I/O module 1794-IT8, (default config= 11 words in, 3 words out)
Module = "1794-IT8 / Auto format"    0x5A, 0x62
EndModule

; Flex I/O module 1794-IJ2, (default config= 7 words in, 8 words out)
Module = "1794-IJ2 / Auto format"    0x56, 0x67
EndModule

; Flex I/O module 1794-ID2, (default config= 8 words in, 5 words out)
Module = "1794-ID2 / Auto format"    0x57, 0x64
EndModule

; Flex I/O module 1794-IP4, (default config= 10 words in, 3 words out)
Module = "1794-IP4 / Auto format"    0x59, 0x62
EndModule

; Flex I/O module 1203-FM1, (default config= 6 words in, 5 words out)
Module = "1203-FM1 / Auto format"    0x55, 0x64
EndModule

; Bentley Nevada Autoc
Module = "BN 1701-15 Rad Vib Mon / Auto"    0x54, 0x69
EndModule
Module = "BN 1701-15 Thrust Mon / Auto"    0x54, 0x69
EndModule
Module = "BN 1701-25 Vel In Mon / Auto"    0x54, 0x69
EndModule
Module = "BN 1701-25 Acc In Mon / Auto"    0x54, 0x69
EndModule

; Definition of modules for condensed format
;=====

; Empty slot for Flex I/O (2 configuration bytes per slot)
Module = "Flex I/O empty slot/Cond format"    0x00, 0x00
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0xFF, 0xFF
EndModule

; AC Modules
;-----

; Flex I/O module 1794-IA8, (default config= 1 word in, 1 word out)
```

```
Module = "1794-IA8 / Condensed format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x85
EndModule

; Flex I/O module 1794-IA8I, (default config= 1 word in, 1 word out)
Module = "1794-IA8I / Condensed format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x80
EndModule

; Flex I/O module 1794-IA16, (default config= 2 word in, 1 word out)
Module = "1794-IA16 / Condensed format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x09
EndModule

; Flex I/O module 1794-OA8, (default config= 0 word in, 1 word out)
Module = "1794-OA8 / Condensed format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x95
EndModule

; Flex I/O module 1794-OA8I, (default config= 0 word in, 1 word out)
Module = "1794-OA8I / Condensed format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x9C
EndModule

; Flex I/O module 1794-OA16, (default config= 1 word in, 2 word out)
Module = "1794-OA16 / Condensed format"    0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x0D
EndModule

; Flex I/O module 1794-IM8, (default config= 2 word in, 1 word out)
Module = "1794-IM8 / Condensed format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x05
EndModule

; Flex I/O module 1794-OM8, (default config= 1 word in, 2 word out)
Module = "1794-OM8 / Condensed format"    0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x05
EndModule

; DC Modules
;-----

; Flex I/O module 1794-IB8, default config= 2 word in, 1 word out)
Module = "1794-IB8 / Condensed format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x80
EndModule

; Flex I/O module 1794-IB8S, default config= 1 word in, 1 word out)
```

```
Module = "1794-IB8S / Condensed format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x89
EndModule

; Flex I/O module 1794-IB16, (default config= 2 word in, 1 word out)
Module = "1794-IB16 / Condensed format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x81
EndModule

; Flex I/O module 1793-IB16/A, S/A, (default config= 2 word in, 1 word out)
Module = "1793-IB16/A, S/A / Cond format"  0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x0D
EndModule

; Flex I/O module 1794-IV16, (default config= 2 word in, 1 word out)
Module = "1794-IV16 / Condensed format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x04
EndModule

; Flex I/O module 1793-IV16/A, S/A, (default config= 2 word in, 1 word out)
Module = "1793-IV16/A, S/A / Cond format"  0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x10
EndModule

; Flex I/O module 1794-OB8, (default config= 0 word in, 1 word out)
Module = "1794-OB8 / Condensed format"     0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x90
EndModule

; Flex I/O module 1794-OB16, (default config= 0 word in, 1 word out)
Module = "1794-OB16 / Condensed format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x91
EndModule

; Flex I/O module 1794-OB16P, (Protected) Module (default config= 0 word in, 1 word
out)
Module = "1794-OB16P / Condensed format"   0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x08
EndModule

; Flex I/O module 1793-OB16P/A, S/A, (Protected) Module (default config= 0 word in,
1 word out)
Module = "1793-OB16P/A, S/A / Cond format"  0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x18
EndModule

; Flex I/O module 1794-OV16, (default config= 0 word in, 2 word out)
Module = "1794-OV16 / Condensed format"    0x00, 0x61
```

```
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x04
EndModule

; Flex I/O module 1794-OV16P, (default config= 0 word in, 1 word out)
Module = "1794-OV16P / Condensed format" 0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x09
EndModule

; Flex I/O module 1793-OV16P/A, S/A, (default config= 0 word in, 1 word out)
Module = "1793-OV16P/A, S/A / Cond format" 0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x19
EndModule

; Flex I/O module 1794-OB8EP, (default config= 1 word in, 2 word out)
Module = "1794-OB8EP / Condensed format" 0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x9D
EndModule

; Flex I/O module 1794-IB10XOB6, (default config= 1 word in, 2 word out)
Module = "1794-IB10XOB6 / Condensed format" 0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x00
EndModule

; Flex I/O module 1794-IC16, (default config= 2 word in, 1 word out)
Module = "1794-IC16 / Condensed format" 0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x08
EndModule

; Flex I/O module 1794-OC16, (default config= 1 word in, 2 word out)
Module = "1794-OC16 / Condensed format" 0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x0C
EndModule

; Flex I/O module 1793-IB4(S), (default config= 2 word in, 1 word out)
Module = "1793-IB4(S) / Condensed format" 0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x0C
EndModule

; Flex I/O module 1793-OB4P(S), (default config= 0 word in, 1 word out)
Module = "1793-OB4P(S) / Condensed format" 0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x10
EndModule

; Flex I/O module 1793-IB2XOB2P(S), (default config= 1 word in, 2 word out)
Module = "1793-IB2XOB2P(S) / Cond format" 0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x11
EndModule
```

```
; Flex I/O module 1794-IB32/A, (default config= 2 word in, 1 word out)
Module = "1794-IB32 / Cond format"    0x51, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x02, 0x11
EndModule

; Flex I/O module 1794-OB32P, (default config= 0 word in, 2 word out)
Module = "1794-OB32P / Cond format"    0x00, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x00, 0x01
EndModule

; Flex I/O module 1794-IB16XOB16P, (default config= 1 word in, 2 word out)
Module = "1794-IB16XOB16P / Cond format"    0x50, 0x61
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x1C
EndModule

; Analog Modules
;-----

; Flex I/O module 1794-IE8, (default config= 9 words in, 1 word out)
Module = "1794-IE8 / Condensed format"    0x58, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x19, 0x24
EndModule

; Flex I/O module 1794-OE4, (default config= 1 word in, 6 words out)
Module = "1794-OE4 / Condensed format"    0x50, 0x65
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x11, 0x25
EndModule

; Flex I/O module 1794-IE4XOE2, (default config= 5 words in, 4 words out)
Module = "1794-IE4XOE2 / Condensed format"    0x54, 0x63
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x26
EndModule

; Flex I/O module 1793-IE4(S), (default config= 9 words in, 1 word out)
Module = "1793-IE4(S) / Condensed format"    0x58, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x19, 0x60
EndModule

; Flex I/O module 1793-OE2(S), (default config= 1 word in, 6 words out)
Module = "1793-OE2(S) / Condensed format"    0x50, 0x65
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x11, 0x61
EndModule

; Flex I/O module 1793-IE2XOE1(S), (default config= 5 words in, 4 words out)
Module = "1793-IE2XOE1(S) / Cond format"    0x54, 0x63
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x62
```

```
EndModule

; Isolated Analog Modules
;-----

; Flex I/O module 1794-IF4I, (default config= 7 words in, 5 words out)
Module = "1794-IF4I / Condensed format"    0x56, 0x64
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x17, 0x20
EndModule

; Flex I/O module 1794-OF4I, (default config= 6 words in, 7 words out)
Module = "1794-OF4I / Condensed format"    0x55, 0x66
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x16, 0x21
EndModule

; Flex I/O module 1794-IF2XOF2I, (default config= 7 words in, 7 words out)
Module = "1794-IF2XOF2I / Condensed format"  0x56, 0x66
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x17, 0x22
EndModule

; Relay Modules
;-----

; Flex I/O module 1794-OW8, (default config= 0 word in, 1 word out)
Module = "1794-OW8 / Condensed format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x99
EndModule

; Flex I/O module 1793-OW4(S), (default config= 0 word in, 1 word out)
Module = "1793-OW4(S) / Condensed format"  0x00, 0x60
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x01, 0x15
EndModule

; Special Modules
;-----

; Flex I/O module 1794-IR8, (default config= 11 words in, 3 words out)
Module = "1794-IR8 / Condensed format"    0x5A, 0x62
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x1B, 0x01
EndModule

; Flex I/O module 1794-IRT8, (default config= 11 words in, 4 words out)
Module = "1794-IRT8 / Condensed format"    0x5A, 0x63
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x1B, 0x03
EndModule

; Flex I/O module 1794-IT8, (default config= 11 words in, 3 words out)
Module = "1794-IT8 / Condensed format"    0x5A, 0x62
Ext_Module_Prm_Data_Len = 2
```

```
Ext_User_Prm_Data_Const(0) = 0x1B, 0x00
EndModule

; Flex I/O module 1794-IJ2, (default config= 7 words in, 8 words out)
Module = "1794-IJ2 / Condensed format" 0x56, 0x67
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x17, 0x01
EndModule

; Flex I/O module 1794-ID2, (default config= 8 words in, 5 words out)
Module = "1794-ID2 / Condensed format" 0x57, 0x64
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x18, 0x04
EndModule

; Flex I/O module 1794-IP4, (default config= 10 words in, 3 words out)
Module = "1794-IP4 / Condensed format" 0x59, 0x62
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x1A, 0x00
EndModule

; Flex I/O module 1203-FM1, (default config= 6 words in, 5 words out)
Module = "1203-FM1 / Condensed format" 0x55, 0x64
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x16, 0x00
EndModule

; Bentley Nevada Cond
Module = "BN 1701-15 Rad Vib Mon / Cond" 0x54, 0x69
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x01
EndModule

Module = "BN 1701-15 Thrust Mon / Cond" 0x54, 0x69
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x01
EndModule

Module = "BN 1701-25 Vel In Mon / Cond" 0x54, 0x69
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x02
EndModule

Module = "BN 1701-25 Acc In Mon / Cond" 0x54, 0x69
Ext_Module_Prm_Data_Len = 2
Ext_User_Prm_Data_Const(0) = 0x15, 0x02
EndModule

; Definition of modules for full format
;=====

; Empty slot for Flex I/O (2 configuration bytes per slot)
```



```
Module = "Flex I/O empty slot/Full format"    0x00, 0x00
Ext_Module_Prm_Data_Len = 3
Ext_User_Prm_Data_Const(0) = 0xFF, 0xFF, 0x00
EndModule

; AC Modules
;-----

; Flex I/O module 1794-IA8, (default config= 1 word in, 0 word out)
Module = "1794-IA8 / Full format"    0x50, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x85, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 4
EndModule

; Flex I/O module 1794-IA8I, (default config= 1 word in, 0 word out)
Module = "1794-IA8I / Full format"    0x50, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x80, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 38
EndModule

; Flex I/O module 1794-IA16, (default config= 2 word in, 0 word out)
Module = "1794-IA16 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x09, 0x10, 0x00, 0x00
;Config word 0
Ext_User_Prm_Data_Ref(4)    = 39
Ext_User_Prm_Data_Ref(4)    = 40
EndModule

; Flex I/O module 1794-OA8, (default config= 0 word in, 1 word out)
Module = "1794-OA8 / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x95, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(4)    = 16
EndModule

; Flex I/O module 1794-OA8I, (default config= 0 word in, 1 word out)
Module = "1794-OA8I / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x9C, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(4)    = 16
EndModule

; Flex I/O module 1794-OA16, (default config= 1 word in, 1 word out)
Module = "1794-OA16 / Full format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x0D, 0x01, 0x00, 0x00
```

```

;Safestate word
Ext_User_Prm_Data_Ref(3) = 7
EndModule

; Flex I/O module 1794-IM8, (default config= 2 word in, 0 word out)
Module = "1794-IM8 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x05, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 41
EndModule

; Flex I/O module 1794-OM8, (default config= 1 word in, 1 word out)
Module = "1794-OM8 / Full format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x05, 0x01, 0x00, 0x00
;Safe state
Ext_User_Prm_Data_Ref(4)    = 16
EndModule

; Flex I/O module 1794-IB8, (default config= 2 word in, 0 word out)
Module = "1794-IB8 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x80, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 42
EndModule

; Flex I/O module 1794-IB8S, (default config= 1 word in, 0 word out)
Module = "1794-IB8S / Full format"    0x50, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x89, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4) = 5
Ext_User_Prm_Data_Ref(4) = 6
EndModule

; Flex I/O module 1794-IB16, (default config= 2 word in, 0 word out)
Module = "1794-IB16 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x81, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 5
Ext_User_Prm_Data_Ref(4)    = 6
EndModule

; Flex I/O module 1793-IB16/A, S/A, (default config= 2 word in, 0 word out)
Module = "1793-IB16/A, S/A / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x0D, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)    = 5
Ext_User_Prm_Data_Ref(4)    = 6
EndModule

; Flex I/O module 1794-IV16,(default config= 2 word in, 0 word out)

```

```
Module = "1794-IV16 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x04, 0x10, 0x00, 0x00
;1 config word
Ext_User_Prm_Data_Ref(3) = 42
Ext_User_Prm_Data_Ref(3) = 43
Ext_User_Prm_Data_Ref(3) = 44
EndModule

; Flex I/O module 1793-IV16/A, S/A,(default config= 2 word in, 0 word out)
Module = "1793-IV16/A, S/A / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x10, 0x10, 0x00, 0x00
;1 config word
Ext_User_Prm_Data_Ref(3) = 42
Ext_User_Prm_Data_Ref(3) = 43
Ext_User_Prm_Data_Ref(3) = 44
EndModule

; Flex I/O module 1794-OB8, (default config= 0 word in, 1 word out)
Module = "1794-OB8 / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x90, 0x01, 0x00, 0x00
;SS1
Ext_User_Prm_Data_Ref(4)    = 16
EndModule

; Flex I/O module 1794-OB16, (default config= 0 word in, 1 word out)
Module = "1794-OB16 / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x91, 0x01, 0x00, 0x00

;Safe state word 1
Ext_User_Prm_Data_Ref(3) = 7
EndModule

; Flex I/O module 1794-OB16P, (default config= 0 word in, 1 word out)
Module = "1794-OB16P / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x08, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)    = 7
EndModule

; Flex I/O module 1793-OB16P/A, S/A, (default config= 0 word in, 1 word out)
Module = "1793-OB16P/A, S/A / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x18, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)    = 7
EndModule

;Flex I/O module 1794-OV16, (default config= 0 word in, 1 word out)
Module = "1794-OV16 / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
```

```
Ext_User_Prm_Data_Const(0) = 0x01, 0x04, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
EndModule

; Flex I/O module 1794-OV16P, (default config= 0 word in, 1 word out)
Module = "1794-OV16P / Full format"   0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x09, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
EndModule

; Flex I/O module 1793-OV16P/A, S/A, (default config= 0 word in, 1 word out)
Module = "1793-OV16P/A, S/A / Full format"   0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x19, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
EndModule

; Flex I/O module 1794-OB8EP, (default config= 1 word in, 2 word out)
Module = "1794-OB8EP / Full format"   0x50, 0x61
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x9D, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
EndModule

; Flex I/O module 1794-IB10XOB6, (default config= 1 word in, 1 word out)
Module = "1794-IB10XOB6 / Full format"   0x50, 0x60
Ext_Module_Prm_Data_Len = 7
Ext_User_Prm_Data_Const(0) = 0x01, 0x00, 0x11, 0x00, 0x00, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(4)   = 16
;Config word 1
Ext_User_Prm_Data_Ref(5)   = 45
EndModule

; Flex I/O module 1794-IC16, (default config= 2 word in, 0 word out)
Module = "1794-IC16 / Full format"   0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x08, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)   = 45
Ext_User_Prm_Data_Ref(4)   = 46
EndModule

; Flex I/O module 1794-OC16, (default config= 1 word in, 1 word out)
Module = "1794-OC16 / Full format"   0x50, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x0C, 0x01, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
EndModule
```

```
; Flex I/O module 1793-IB4(S), (default config= 2 word in, 0 word out)
Module = "1793-IB4(S) / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x0C, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4)   = 47
EndModule

; Flex I/O module 1793-OB4P(S), (default config= 0 word in, 1 word out)
Module = "1793-OB4P(S) / Full format"    0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x10, 0x01, 0x00, 0x00
;Safe state word
Ext_User_Prm_Data_Ref(4)   = 48
EndModule

; Flex I/O module 1793-IB2XOB2P(S), (default config= 1 word in, 2 word out)
Module = "1793-IB2XOB2P(S) / Full format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 7
Ext_User_Prm_Data_Const(0) = 0x01, 0x11, 0x11, 0x00, 0x00, 0x00, 0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(4)   = 49
;Config word 1
Ext_User_Prm_Data_Ref(6)   = 50
EndModule

; Flex I/O module 1794-IB32/A, (default config= 2 word in, 0 word out)
Module = "1794-IB32 / Full format"    0x51, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x02, 0x11, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(4) = 256;
EndModule

; Flex I/O module 1794-OB32P, (default config= 0 word in, 2 word out)
Module = "1794-OB32P / Full format"    0x00, 0x61
Ext_Module_Prm_Data_Len = 7
Ext_User_Prm_Data_Const(0) = 0x00, 0x01, 0x02, 0x00, 0x00, 0x00, 0x00
; 2 Safe state words
Ext_User_Prm_Data_Ref(3) = 7;
Ext_User_Prm_Data_Ref(5) = 8;
EndModule

; Flex I/O module 1794-IB16XOB16P, (default config= 1 word in, 1 word out)
Module = "1794-IB16XOB16P / Full format"    0x50, 0x60
Ext_Module_Prm_Data_Len = 7
Ext_User_Prm_Data_Const(0) = 0x01, 0x1C, 0x11, 0x00, 0x00, 0x00, 0x00
; 1 Safe state word
Ext_User_Prm_Data_Ref(3) = 7;
; 1 Config word
```

```
Ext_User_Prm_Data_Ref(6) = 256;
EndModule

; Flex I/O module 1794-IE8, (default config= 9 words in, 0 word out)
Module = "1794-IE8 / Full format" 0x58, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x19, 0x24, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(3) = 11
EndModule

; Flex I/O module 1794-OE4, (default config= 1 word in, 4 words out)
Module = "1794-OE4 / Full format" 0x50, 0x63
Ext_Module_Prm_Data_Len = 15
Ext_User_Prm_Data_Const(0) = 0x11, 0x25, 0x24, 0x00, 0x00, 0x00, 0x00, 0x00, \
                          0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
; Safe state word 1-4
Ext_User_Prm_Data_Ref(3) = 7
Ext_User_Prm_Data_Ref(5) = 8
Ext_User_Prm_Data_Ref(7) = 9
Ext_User_Prm_Data_Ref(9) = 10
;Config word 1
Ext_User_Prm_Data_Ref(12) = 12
Ext_User_Prm_Data_Ref(12) = 13
Ext_User_Prm_Data_Ref(12) = 14
Ext_User_Prm_Data_Ref(12) = 15
;Config word 2
Ext_User_Prm_Data_Ref(13) = 11
EndModule

; Flex I/O module 1794-IE4XOE2, (default config= 5 words in, 2 words out)
Module = "1794-IE4XOE2 / Full format" 0x54, 0x61
Ext_Module_Prm_Data_Len = 11
Ext_User_Prm_Data_Const(0) = 0x15, 0x26, 0x22, 0x00, 0x00, 0x00, 0x00, 0x00, \
                          0x00, 0x00, 0x00
;Safe state word 1-2
Ext_User_Prm_Data_Ref(3) = 7
Ext_User_Prm_Data_Ref(5) = 8
;Config word 1
Ext_User_Prm_Data_Ref(8) = 12
Ext_User_Prm_Data_Ref(8) = 13
;Config word 2
Ext_User_Prm_Data_Ref(9) = 11
EndModule

; Flex I/O module 1793-IE4(S), (default config= 9 words in, 0 word out)
Module = "1793-IE4(S) / Full format" 0x58, 0x00
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x19, 0x60, 0x10, 0x00, 0x00
;Config word 1
Ext_User_Prm_Data_Ref(3) = 52
Ext_User_Prm_Data_Ref(4) = 51
EndModule
```

```

; Flex I/O module 1793-OE2(S), (default config= 1 word in, 6 words out)
Module = "1793-OE2(S) / Full format"    0x50, 0x63
Ext_Module_Prm_Data_Len = 11
Ext_User_Prm_Data_Const(0) = 0x11, 0x61, 0x22, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00

;Safe state word 1-2
Ext_User_Prm_Data_Ref(3)   = 7
Ext_User_Prm_Data_Ref(5)   = 8
;Config word 1
Ext_User_Prm_Data_Ref(8)   = 53
;Config word 2
Ext_User_Prm_Data_Ref(9)   = 54
Ext_User_Prm_Data_Ref(10)  = 55
EndModule

; Flex I/O module 1793-IE2XOE1(S), (default config= 5 words in, 2 words out)
Module = "1793-IE2XOE1(S) / Full format"    0x54, 0x61
Ext_Module_Prm_Data_Len = 9
Ext_User_Prm_Data_Const(0) = 0x15, 0x62, 0x21, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00
;Safe state word 1
Ext_User_Prm_Data_Ref(3)   = 7
;Config word 1
Ext_User_Prm_Data_Ref(6)   = 56
;Config word 2
Ext_User_Prm_Data_Ref(7)   = 57
Ext_User_Prm_Data_Ref(8)   = 58
EndModule

; Isolated Analog Modules
;-----

; Flex I/O module 1794-IF4I, (default config= 7 words in, 0 words out)
Module = "1794-IF4I / Full format"    0x56, 0x00
Ext_Module_Prm_Data_Len = 13
Ext_User_Prm_Data_Const(0) = 0x17, 0x20, 0x50, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00
;Config word 2 - Chnl filter
Ext_User_Prm_Data_Ref(5)   = 59
;Config word 3 - Chnl Config
Ext_User_Prm_Data_Ref(7)   = 60
;Config word 4 - RT sample interval
Ext_User_Prm_Data_Ref(9)   = 61
;Config word 5
Ext_User_Prm_Data_Ref(11)  = 73
Ext_User_Prm_Data_Ref(11)  = 62
Ext_User_Prm_Data_Ref(11)  = 63
Ext_User_Prm_Data_Ref(11)  = 64                                ;Interrupt toggle bit

Ext_User_Prm_Data_Ref(12)  = 65                                ;Revert to def bit
Ext_User_Prm_Data_Ref(12)  = 66
Ext_User_Prm_Data_Ref(12)  = 67
Ext_User_Prm_Data_Ref(12)  = 68
Ext_User_Prm_Data_Ref(12)  = 69
Ext_User_Prm_Data_Ref(12)  = 70

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Ext_User_Prm_Data_Ref(12) = 71
Ext_User_Prm_Data_Ref(12) = 72 ;Ch 3
EndModule

; Flex I/O module 1794-OF4I, (default config= 6 words in, 5 words out)
Module = "1794-OF4I / Full format" 0x55, 0x64
Ext_Module_Prm_Data_Len = 15
Ext_User_Prm_Data_Const(0) = 0x16, 0x21, 0x24, 0x00, 0x00, 0x00, 0x00, 0x00, \
                          0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
;Safe state word 1-4
Ext_User_Prm_Data_Ref(3) = 7 ;SS 1
Ext_User_Prm_Data_Ref(5) = 8
Ext_User_Prm_Data_Ref(7) = 9
Ext_User_Prm_Data_Ref(9) = 10 ;SS 4
;Config word 1
Ext_User_Prm_Data_Ref(11) = 60 ;Channel 3,2,1,0 Configuration
;Config word 2
Ext_User_Prm_Data_Ref(13) = 62 ;Initiate conf bit
Ext_User_Prm_Data_Ref(13) = 73
Ext_User_Prm_Data_Ref(13) = 63
Ext_User_Prm_Data_Ref(13) = 64
Ext_User_Prm_Data_Ref(13) = 77
Ext_User_Prm_Data_Ref(13) = 76
Ext_User_Prm_Data_Ref(13) = 75
Ext_User_Prm_Data_Ref(13) = 74 ;Req for outputs to hold 0

Ext_User_Prm_Data_Ref(14) = 65 ;Revert to def
Ext_User_Prm_Data_Ref(14) = 66
Ext_User_Prm_Data_Ref(14) = 67
Ext_User_Prm_Data_Ref(14) = 68
Ext_User_Prm_Data_Ref(14) = 72
Ext_User_Prm_Data_Ref(14) = 71
Ext_User_Prm_Data_Ref(14) = 70
Ext_User_Prm_Data_Ref(14) = 69 ;Enable channel nr 0
EndModule

; Flex I/O module 1794-IF2XOF2I, (default config= 7 words in, 3 words out)
Module = "1794-IF2XOF2I / Full format" 0x56, 0x62
Ext_Module_Prm_Data_Len = 15
Ext_User_Prm_Data_Const(0) = 0x17, 0x22, 0x42, 0x00, 0x00, 0x00, 0x00, 0x00, \
                          0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
;Safe state wor 1-2
Ext_User_Prm_Data_Ref(3) = 7
Ext_User_Prm_Data_Ref(5) = 8
;Config word
Ext_User_Prm_Data_Ref(8) = 78 ;Input ch 1 filter
Ext_User_Prm_Data_Ref(8) = 79 ;ch 0
;Config word 2
Ext_User_Prm_Data_Ref(9) = 80 ;Output channel 1 conf
Ext_User_Prm_Data_Ref(9) = 81
Ext_User_Prm_Data_Ref(10) = 82
Ext_User_Prm_Data_Ref(10) = 83 ;Input channel 0 conf
;Config word 3
Ext_User_Prm_Data_Ref(11) = 61 ;Real time sample programmed
interval

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;Config word 4
Ext_User_Prm_Data_Ref(13) = 62           ;Initiate configuration
Ext_User_Prm_Data_Ref(13) = 73
Ext_User_Prm_Data_Ref(13) = 63
Ext_User_Prm_Data_Ref(13) = 64
Ext_User_Prm_Data_Ref(13) = 88
Ext_User_Prm_Data_Ref(13) = 89           ;Req output 0 to hold

Ext_User_Prm_Data_Ref(14) = 65           ;Revert to defaults
Ext_User_Prm_Data_Ref(14) = 66
Ext_User_Prm_Data_Ref(14) = 67
Ext_User_Prm_Data_Ref(14) = 68
Ext_User_Prm_Data_Ref(14) = 87
Ext_User_Prm_Data_Ref(14) = 86
Ext_User_Prm_Data_Ref(14) = 85
Ext_User_Prm_Data_Ref(14) = 84           ;Enable Input 0
EndModule

; Flex I/O module 1794-OW8, (default config= 0 word in, 1 word out)
Module = "1794-OW8 / Full format" 0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x99, 0x01, 0x00, 0x00
;1 safe state word
;SS
Ext_User_Prm_Data_Ref(4) = 16
;No config
EndModule

; Flex I/O module 1793-OW4(S), (default config= 0 word in, 1 word out)
Module = "1793-OW4(S) / Full format" 0x00, 0x60
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x01, 0x15, 0x01, 0x00, 0x00
;SS word 1
Ext_User_Prm_Data_Ref(4) = 48           ;4 lsb bits in low byte
EndModule

; Flex I/O module 1794-IR8, (default config= 11 words in, 0 words out)
Module = "1794-IR8 / Full format" 0x5A, 0x00
Ext_Module_Prm_Data_Len = 9
Ext_User_Prm_Data_Const(0) = 0x1B, 0x01, 0x30, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00
;Config word1
Ext_User_Prm_Data_Ref(3) = 17           ;8 bit mask
Ext_User_Prm_Data_Ref(4) = 91
Ext_User_Prm_Data_Ref(4) = 90
Ext_User_Prm_Data_Ref(4) = 18
Ext_User_Prm_Data_Ref(4) = 19
Ext_User_Prm_Data_Ref(4) = 20           ;MDT
;Config word2
Ext_User_Prm_Data_Ref(5) = 24
Ext_User_Prm_Data_Ref(5) = 23
Ext_User_Prm_Data_Ref(6) = 22
Ext_User_Prm_Data_Ref(6) = 21

```

```

;Config word3
Ext_User_Prm_Data_Ref(7) = 28
Ext_User_Prm_Data_Ref(7) = 27
Ext_User_Prm_Data_Ref(8) = 26
Ext_User_Prm_Data_Ref(8) = 25
EndModule

; Flex I/O module 1794-IRT8, (default config= 11 words in, 0 words out)
Module = "1794-IRT8 / Full format" 0x5A, 0x00
Ext_Module_Prm_Data_Len = 11
Ext_User_Prm_Data_Const(0) = 0x1B, 0x03, 0x40, 0x00, 0x00, 0x00, 0x00, 0x00, \
0x00, 0x00, 0x00

;Config word 1
Ext_User_Prm_Data_Ref(3) = 92 ;Data format
Ext_User_Prm_Data_Ref(4) = 93
Ext_User_Prm_Data_Ref(4) = 94
Ext_User_Prm_Data_Ref(4) = 95
Ext_User_Prm_Data_Ref(4) = 96 ;Filter cut-off
;Config word 2
Ext_User_Prm_Data_Ref(5) = 97 ;High byte - TC/RTD 4-7
Ext_User_Prm_Data_Ref(5) = 99
Ext_User_Prm_Data_Ref(5) = 101
Ext_User_Prm_Data_Ref(6) = 98
Ext_User_Prm_Data_Ref(6) = 100
Ext_User_Prm_Data_Ref(6) = 102 ;Sensor type 0-3
;Config word 3
Ext_User_Prm_Data_Ref(7) = 103 ;RTD offset ch 7
Ext_User_Prm_Data_Ref(7) = 104
Ext_User_Prm_Data_Ref(7) = 105
Ext_User_Prm_Data_Ref(7) = 106
Ext_User_Prm_Data_Ref(8) = 107
Ext_User_Prm_Data_Ref(8) = 108
Ext_User_Prm_Data_Ref(8) = 109
Ext_User_Prm_Data_Ref(8) = 110 ;RTD offset ch 0
;Config word 4
Ext_User_Prm_Data_Ref(9) = 111 ;EDT cw
EndModule

; Flex I/O module 1794-IT8, (default config= 11 words in, 0 words out)
Module = "1794-IT8 / Full format" 0x5A, 0x00
Ext_Module_Prm_Data_Len = 9
Ext_User_Prm_Data_Const(0) = 0x1B, 0x00, 0x30, 0x00, 0x00, 0x00, 0x00, 0x00, \
0x00

;Config word 1
Ext_User_Prm_Data_Ref(3) = 17 ;Cal mask
Ext_User_Prm_Data_Ref(4) = 91
Ext_User_Prm_Data_Ref(4) = 90
Ext_User_Prm_Data_Ref(4) = 18
Ext_User_Prm_Data_Ref(4) = 29
Ext_User_Prm_Data_Ref(4) = 20 ;MDT
;Config word 2
Ext_User_Prm_Data_Ref(5) = 33
Ext_User_Prm_Data_Ref(5) = 32
Ext_User_Prm_Data_Ref(6) = 31
Ext_User_Prm_Data_Ref(6) = 30
;Config word 3
Ext_User_Prm_Data_Ref(7) = 37

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```

Ext_User_Prm_Data_Ref(7) = 36
Ext_User_Prm_Data_Ref(8) = 35
Ext_User_Prm_Data_Ref(8) = 34
EndModule

; Flex I/O module 1794-IJ2, (default config= 7 words in, 8 words out)
Module = "1794-IJ2 / Full format"    0x56, 0x00
Ext_Module_Prm_Data_Len = 19
Ext_User_Prm_Data_Const(0) = 0x17, 0x01, 0x80, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00

;Config word 0
Ext_User_Prm_Data_Ref(3) = 112                ;Communication fault
Ext_User_Prm_Data_Ref(3) = 113
Ext_User_Prm_Data_Ref(3) = 114
Ext_User_Prm_Data_Ref(3) = 116
Ext_User_Prm_Data_Ref(3) = 118
Ext_User_Prm_Data_Ref(4) = 120
Ext_User_Prm_Data_Ref(4) = 115
Ext_User_Prm_Data_Ref(4) = 117
Ext_User_Prm_Data_Ref(4) = 119                ;Missing pulse multiplier ch 1

;Config word 1
Ext_User_Prm_Data_Ref(5) = 121                ;Max frequency ch 0
;Config word 2
Ext_User_Prm_Data_Ref(7) = 254                ;Frequency scaling ch 0
Ext_User_Prm_Data_Ref(8) = 123
;Config word 3
Ext_User_Prm_Data_Ref(9) = 125                ;Wire off fault select GI
Ext_User_Prm_Data_Ref(9) = 127
Ext_User_Prm_Data_Ref(9) = 129
Ext_User_Prm_Data_Ref(9) = 131
Ext_User_Prm_Data_Ref(9) = 133
Ext_User_Prm_Data_Ref(10) = 135
Ext_User_Prm_Data_Ref(10) = 137
Ext_User_Prm_Data_Ref(10) = 139
Ext_User_Prm_Data_Ref(10) = 141
Ext_User_Prm_Data_Ref(10) = 143              ;Wire-off/Missing pulse fault
select mode
;Config word 4
Ext_User_Prm_Data_Ref(11) = 122                ;Max frequency ch 1
;Config word 5
Ext_User_Prm_Data_Ref(13) = 255                ;Frequency scaling ch 1
Ext_User_Prm_Data_Ref(14) = 124
;Config word 6
Ext_User_Prm_Data_Ref(15) = 126                ;Wire off fault select GI
Ext_User_Prm_Data_Ref(15) = 128
Ext_User_Prm_Data_Ref(15) = 130
Ext_User_Prm_Data_Ref(15) = 132
Ext_User_Prm_Data_Ref(15) = 134
Ext_User_Prm_Data_Ref(16) = 136
Ext_User_Prm_Data_Ref(16) = 138
Ext_User_Prm_Data_Ref(16) = 140
Ext_User_Prm_Data_Ref(16) = 142
Ext_User_Prm_Data_Ref(16) = 144              ;Wire-off/Missing pulse fault
select mode

```

```

EndModule

; Flex I/O module 1794-ID2, (default config= 8 words in, 5 words out)
Module = "1794-ID2 / Full format"    0x57, 0x00
Ext_Module_Prm_Data_Len = 13
Ext_User_Prm_Data_Const(0) = 0x18, 0x04, 0x50, 0x00, 0x00, 0x00, 0x00, 0x00, \
                             0x00, 0x00, 0x00, 0x00, 0x00

;Config word 1
Ext_User_Prm_Data_Ref(3)   = 145           ;Preset reset bit - High byte
Ext_User_Prm_Data_Ref(3)   = 146
Ext_User_Prm_Data_Ref(3)   = 147
Ext_User_Prm_Data_Ref(3)   = 148
Ext_User_Prm_Data_Ref(3)   = 149
Ext_User_Prm_Data_Ref(3)   = 150
Ext_User_Prm_Data_Ref(4)   = 151
Ext_User_Prm_Data_Ref(4)   = 152
Ext_User_Prm_Data_Ref(4)   = 153
Ext_User_Prm_Data_Ref(4)   = 154
Ext_User_Prm_Data_Ref(4)   = 155
Ext_User_Prm_Data_Ref(4)   = 156           ;Mode selection

;Config word 2
Ext_User_Prm_Data_Ref(5)   = 157           ;Preset reset bit
Ext_User_Prm_Data_Ref(5)   = 158
Ext_User_Prm_Data_Ref(5)   = 159
Ext_User_Prm_Data_Ref(5)   = 160
Ext_User_Prm_Data_Ref(5)   = 161
Ext_User_Prm_Data_Ref(5)   = 162
Ext_User_Prm_Data_Ref(6)   = 163
Ext_User_Prm_Data_Ref(6)   = 164
Ext_User_Prm_Data_Ref(6)   = 165
Ext_User_Prm_Data_Ref(6)   = 166
Ext_User_Prm_Data_Ref(6)   = 167
Ext_User_Prm_Data_Ref(6)   = 168           ;Mode selection
;Config word 3
Ext_User_Prm_Data_Ref(7)   = 169
;Config word 4
Ext_User_Prm_Data_Ref(9)   = 170
;Config Word 5
Ext_User_Prm_Data_Ref(11)  = 259           ;Filter Constants
Ext_User_Prm_Data_Ref(12)  = 257           ;Filter A0 Enable
Ext_User_Prm_Data_Ref(12)  = 258           ;Filter A1 Enable
EndModule

; Flex I/O module 1794-IP4, (default config= 10 words in, 0 words out)
Module = "1794-IP4 / Full format"    0x59, 0x00
Ext_Module_Prm_Data_Len = 9
Ext_User_Prm_Data_Const(0) = 0x1A, 0x00, 0x30, 0x00, 0x00, 0x00, 0x00, 0x00, \
                             0x00

;3 config words
;Config word 1
Ext_User_Prm_Data_Ref(4)   = 171           ;Pulse counting and period time
measure ch 3
Ext_User_Prm_Data_Ref(4)   = 172
Ext_User_Prm_Data_Ref(4)   = 173
Ext_User_Prm_Data_Ref(4)   = 174           ;PCAPTM ch 0
;Config word 2

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Ext_User_Prm_Data_Ref(5) = 175 ;Number of periods sel Ch 3
Ext_User_Prm_Data_Ref(5) = 176 ;Clock freq Ch3
Ext_User_Prm_Data_Ref(5) = 177
Ext_User_Prm_Data_Ref(5) = 178
Ext_User_Prm_Data_Ref(6) = 179
Ext_User_Prm_Data_Ref(6) = 180
Ext_User_Prm_Data_Ref(6) = 181
Ext_User_Prm_Data_Ref(6) = 182 ;Clock freq Ch0
;Config word 3
Ext_User_Prm_Data_Ref(8) = 183 ;Start new measure Ch 3
Ext_User_Prm_Data_Ref(8) = 184
Ext_User_Prm_Data_Ref(8) = 185
Ext_User_Prm_Data_Ref(8) = 186 ;Start new measure Ch 0 - Low byte
EndModule

; Flex I/O module 1203-FM1, 24V dc SCANport Module (default config= 6 words in, 5
words out)
Module = "1203-FM1 / Full format" 0x55, 0x64
Ext_Module_Prm_Data_Len = 3
Ext_User_Prm_Data_Const(0) = 0x16, 0x00, 0x00
EndModule

Module = "BN 1701-15 Rad Vib Mon / Full" 0x54, 0x60
Ext_Module_Prm_Data_Len = 23
Ext_User_Prm_Data_Const(0) = 0x15, 0x01, 0xA0, 0x00, 0x00, 0x00, 0x00, 0x00, \
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, \
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
;10(A) config words, 0 safe state words.
;Config word1
Ext_User_Prm_Data_Ref(3) = 187

;Config word2
Ext_User_Prm_Data_Ref(5) = 188

;Config word3
Ext_User_Prm_Data_Ref(7) = 191
Ext_User_Prm_Data_Ref(8) = 193

;Config word4
Ext_User_Prm_Data_Ref(9) = 192
Ext_User_Prm_Data_Ref(10) = 194

;Config word5
Ext_User_Prm_Data_Ref(11) = 195
Ext_User_Prm_Data_Ref(12) = 196

;Config word6
Ext_User_Prm_Data_Ref(13) = 197
Ext_User_Prm_Data_Ref(14) = 198

;Config word7
Ext_User_Prm_Data_Ref(15) = 199
Ext_User_Prm_Data_Ref(16) = 200

;Config word8
Ext_User_Prm_Data_Ref(17) = 201

```

```
Ext_User_Prm_Data_Ref(17) = 202
Ext_User_Prm_Data_Ref(18) = 203
Ext_User_Prm_Data_Ref(18) = 204

;Config word9
Ext_User_Prm_Data_Ref(19) = 205
Ext_User_Prm_Data_Ref(19) = 206
Ext_User_Prm_Data_Ref(20) = 207
Ext_User_Prm_Data_Ref(20) = 208

;Config word10
Ext_User_Prm_Data_Ref(21) = 209
Ext_User_Prm_Data_Ref(21) = 210
Ext_User_Prm_Data_Ref(21) = 211
Ext_User_Prm_Data_Ref(21) = 212
Ext_User_Prm_Data_Ref(21) = 213

Ext_User_Prm_Data_Ref(22) = 214
Ext_User_Prm_Data_Ref(22) = 215
Ext_User_Prm_Data_Ref(22) = 216
Ext_User_Prm_Data_Ref(22) = 217
Ext_User_Prm_Data_Ref(22) = 218
Ext_User_Prm_Data_Ref(22) = 219
EndModule

Module = "BN 1701-15 Thrust Mon / Full"    0x54, 0x60
Ext_Module_Prm_Data_Len = 23
Ext_User_Prm_Data_Const(0) = 0x15, 0x01, 0xA0, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x04, 0x00
;10(A) config words, 0 safe state words.
;Config word1
Ext_User_Prm_Data_Ref(3) = 187

;Config word2
Ext_User_Prm_Data_Ref(5) = 188

;Config word3
Ext_User_Prm_Data_Ref(7) = 222

;Config word4
Ext_User_Prm_Data_Ref(9) = 223

;Config word5
Ext_User_Prm_Data_Ref(11) = 224
Ext_User_Prm_Data_Ref(12) = 225

;Config word6
Ext_User_Prm_Data_Ref(13) = 226
Ext_User_Prm_Data_Ref(14) = 227

;Config word7
Ext_User_Prm_Data_Ref(15) = 228
Ext_User_Prm_Data_Ref(16) = 229

;Config word8
```

```
Ext_User_Prm_Data_Ref(17) = 230
Ext_User_Prm_Data_Ref(18) = 231

;Config word9
Ext_User_Prm_Data_Ref(19) = 205
Ext_User_Prm_Data_Ref(19) = 206
Ext_User_Prm_Data_Ref(20) = 207
Ext_User_Prm_Data_Ref(20) = 208

;Config word10
Ext_User_Prm_Data_Ref(21) = 209
Ext_User_Prm_Data_Ref(21) = 210
Ext_User_Prm_Data_Ref(21) = 211
Ext_User_Prm_Data_Ref(21) = 253
Ext_User_Prm_Data_Ref(21) = 212
Ext_User_Prm_Data_Ref(21) = 213

Ext_User_Prm_Data_Ref(22) = 232
Ext_User_Prm_Data_Ref(22) = 233
Ext_User_Prm_Data_Ref(22) = 218
Ext_User_Prm_Data_Ref(22) = 219
EndModule

Module = "BN 1701-25 Vel In Mon / Full"    0x54, 0x60
Ext_Module_Prm_Data_Len = 23
Ext_User_Prm_Data_Const(0) = 0x15, 0x02, 0xA0, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00

;10(A) config words.
;Config word1
Ext_User_Prm_Data_Ref(3) = 187

;Config word2
Ext_User_Prm_Data_Ref(5) = 188

;Config word3
Ext_User_Prm_Data_Ref(7) = 236
Ext_User_Prm_Data_Ref(7) = 238

;Config word4
Ext_User_Prm_Data_Ref(9) = 237
Ext_User_Prm_Data_Ref(9) = 239

;Config word6
Ext_User_Prm_Data_Ref(13) = 197
Ext_User_Prm_Data_Ref(14) = 198

;Config word7
Ext_User_Prm_Data_Ref(15) = 199
Ext_User_Prm_Data_Ref(16) = 200

;Config word8
Ext_User_Prm_Data_Ref(17) = 240
Ext_User_Prm_Data_Ref(17) = 241

Ext_User_Prm_Data_Ref(18) = 242
Ext_User_Prm_Data_Ref(18) = 243
```

```
;Config word9
Ext_User_Prm_Data_Ref(19) = 205
Ext_User_Prm_Data_Ref(19) = 206
Ext_User_Prm_Data_Ref(20) = 207
Ext_User_Prm_Data_Ref(20) = 208

;Config word10
Ext_User_Prm_Data_Ref(21) = 209
Ext_User_Prm_Data_Ref(21) = 210
Ext_User_Prm_Data_Ref(21) = 211
Ext_User_Prm_Data_Ref(21) = 212
Ext_User_Prm_Data_Ref(21) = 213

Ext_User_Prm_Data_Ref(22) = 214
Ext_User_Prm_Data_Ref(22) = 215
Ext_User_Prm_Data_Ref(22) = 216
Ext_User_Prm_Data_Ref(22) = 217
Ext_User_Prm_Data_Ref(22) = 218
Ext_User_Prm_Data_Ref(22) = 219
EndModule

Module = "BN 1701-25 Acc In Mon / Full"    0x54, 0x60
Ext_Module_Prm_Data_Len = 23
Ext_User_Prm_Data_Const(0) = 0x15, 0x02, 0xA0, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, \
                                0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00

;10(A) config words
;Config word1
Ext_User_Prm_Data_Ref(3) = 187

;Config word2
Ext_User_Prm_Data_Ref(5) = 188

;Config word3
Ext_User_Prm_Data_Ref(7) = 246
Ext_User_Prm_Data_Ref(7) = 238

;Config word4
Ext_User_Prm_Data_Ref(9) = 247
Ext_User_Prm_Data_Ref(9) = 239

;Config word6
Ext_User_Prm_Data_Ref(13) = 197
Ext_User_Prm_Data_Ref(14) = 198

;Config word7
Ext_User_Prm_Data_Ref(15) = 199
Ext_User_Prm_Data_Ref(16) = 200

;Config word8
Ext_User_Prm_Data_Ref(17) = 248
Ext_User_Prm_Data_Ref(17) = 249

Ext_User_Prm_Data_Ref(18) = 250
Ext_User_Prm_Data_Ref(18) = 251
```



```
;Config word9
Ext_User_Prm_Data_Ref(19) = 205
Ext_User_Prm_Data_Ref(19) = 206
Ext_User_Prm_Data_Ref(20) = 207
Ext_User_Prm_Data_Ref(20) = 208

;Config word10
Ext_User_Prm_Data_Ref(21) = 209
Ext_User_Prm_Data_Ref(21) = 210
Ext_User_Prm_Data_Ref(21) = 211
Ext_User_Prm_Data_Ref(21) = 252
Ext_User_Prm_Data_Ref(21) = 212
Ext_User_Prm_Data_Ref(21) = 213

Ext_User_Prm_Data_Ref(22) = 214
Ext_User_Prm_Data_Ref(22) = 215
Ext_User_Prm_Data_Ref(22) = 216
Ext_User_Prm_Data_Ref(22) = 217
Ext_User_Prm_Data_Ref(22) = 218
Ext_User_Prm_Data_Ref(22) = 219
EndModule
```



## 8 Glossary

This Glossary contains terms specific to 3170-PDP and PROFIBUS FMS and DP.

**Rockwell Automation communication defaults**

values used for communication configuration data such as OD, CRL (for FMS) DP slave database, and bus parameters whenever the coprocessor's working RAM configuration is reinitialised.

**application layer**

the seventh layer of the seven-layer OSI reference model. This layer is where the coprocessor first interacts with the application program.

**baud rate**

the speed of communication between devices on the network. All devices must communicate at the same rate.

**broadcast relationships**

allow transmission of messages to all nodes simultaneously, but only unconfirmed services are available.

**bus parameters**

communication parameters used by Link Layer. Main Bus Parameters are station address, maximum address and baud rate. These can be changed using the Local Station Manager or PROFIBUS Manager.

**client**

the FMS device that makes use of resources to perform some type of application function.

**CLOSE command**

in FMS, terminates the connection with a remote node on the network.

**communication object model**

describes the externally visible behavior associated with an FMS service or group of services. Three types of communication object models are domain objects, program invocation objects and variable objects.

### CREF

communication reference. In FMS, an index assigned to each entry connection defined in the CRL.

### CSTAT

a qualifier that allows to save the status of a connection.

### communication parameters

parameters within the PROFIBUS communication layers that control the communication process. They are used to configure and indicate current status of communication and consist of the OD, CRL, bus parameters for FMS, and slave database and bus parameters for DP.

### communication relationship

in FMS, defines all the parameters for the communication between two nodes.

### configuration management

in FMS, set of FMA 7 services to upload and download the PROFIBUS bus parameters, CRL, and to read SAP status and station identification.

### connector header

a connector that attaches between the processor and coprocessor and provides communication between the two modules.

### connection type

in FMS, the type of connection between two nodes. There are three connection types: defined (D), open at the responder (O), and open at the initiator (I)

### connection zero

opens automatically during the coprocessor's power-up and allows access to local data either by physical addressing or via objects defined locally in the OD.

### consistency

the DP protocol allows to associate data consistency requirements with blocks of data exchanged between a PLC master and its slaves. A consistent block of data must always be written or read as a whole, because contained data is not independent. For example, when it holds both real data and data identification, or when granularity exceeds 2 bytes (for example, floating point data).

### context management

set of FMA 7 services that establishes and releases connections

**coprocessor**

the 1785-PFB/B PROFIBUS Coprocessor module

**CRL**

Communication Relationship List. In FMS, a CRL is a database within the station, holding the description of all communication relationships of that station to all other stations, independent of the time of use. For more information on CRLs, refer to DIN 19245 Part 2: Process Field Bus.

**default settings**

values used for communication configuration data such as OD, CRL (for FMS) DP slave database, and bus parameters whenever the coprocessor's working RAM configuration is reinitialized.

**defined connection**

in FMS, a connection type that specifies both end nodes of the channel by giving their network address and the FDL service access points (SAPs) used in both nodes

**diagnostics**

three LED indicators located on the front panel of the coprocessor provide the user with the status of the coprocessor and its communication channels. Also referred to as *user interface*.

**domain object**

in FMS, represents a portion of the processor's memory image. In the coprocessor, represents the processor's entire memory image.

**DIN**

Deutsches Institut für Normung. The German Normalization Agency.

**DP**

Decentralized Periphery. A German/European standard (DIN 19245 Part 3) that specifies a simplified user interface with PROFIBUS link layer services and protocol to use with decentralized peripherals.

**DP interface**

a 9-pin female D-shell connector located at Port 2 on the front panel of the coprocessor.

**EC 96**

European Community 1996. European Union Directives for 1996.

EMC

Electro-magnetic Compatibility.

ESD

Electrostatic Discharge. Can cause internal circuit damage to the coprocessor.

FDL

Fieldbus Data Link. A German standard (DIN 19245 Part 1) that specifies the Data Link layer of the PROFIBUS fieldbus.

FMA

Fieldbus Management. A German standard (DIN 19245 Parts 1 and 2) that specifies the network management services and protocol of the PROFIBUS fieldbus.

FMS

Fieldbus Message Specification. A German standard (DIN 19245 Part 2) that specifies the Application Layer services and protocol of the PROFIBUS fieldbus.

FMS interface

a 9-pin female D-shell connector located at Port 1 on the front panel of the coprocessor.

FMS Physical Access Addressing

FMS option that allows the access of data at a physical address by specifying the address in the service.

FMS Symbolic Access Addressing

FMS option that allows to statically associate a symbolic name or short reference number (or index) with a physical address within a node.

fault management

set of FMA 7 services that allows resetting the communication and indicates communication faults and events

HPRIO

High Priority service request. A qualifier to specify high priority for unconfirmed services such as UINFO and USTAT.

I/O chassis

the chassis or rack that serves as the location for the processor, coprocessor, power supply and other I/O modules. Also referred to as *chassis*.

**LED**

Light-emitting diode.

**link layer**

defines a hybrid method for accessing the communication medium (bus) with master/active stations or slave/passive stations.

**Local Station Manager**

Rockwell Automation PC program that runs under Microsoft Windows version 3.1. This program transfers data (FDL, CRL, OD, station address, communication rate, and maximum station address) between the PC and the coprocessor over RS-232.

**logical module**

DP protocol describes I/O data exchanged between a PLC master and a slave device as a set of logical modules (up to 64, but 32 preferred) each one featuring up to 16 bits maximum of inputs, outputs or a combination of both. The actual structure of exchanged input and output frames is deduced from this description.

**lower layer interface (LLI)**

in FMS, responsible for interfacing the FMS layer 7 with FDL layer 2. LLI manages connections

**LSAP or SAP**

Link layer Service Access Point. A logical sub-addresses within devices that allow the distribution of communication flow over dedicated tasks, depending on the required processing. FMS uses LSAPs indifferently to define generic communication relationships between two devices (logical communication channels). DP uses predefined LSAPs to access specific functions or services between masters and slaves.

**master**

initiates transfer of messages without any prior remote request. The right to access the bus (token) is circulated among the master stations. Management of this logical token ring is performed automatically by the masters (such as startup, removal or insertion of masters). Also referred to as *active stations* or *scanner*.

**module**

any of the plug-in hardware devices that are located in the 1771 I/O chassis: processor, coprocessor, power supply or I/O module

**module slot**

location in the I/O chassis for installing a module. Each module slides into a module slot that lines up with the backplane connector. Also referred to as *slot*.

---

multicast relationships

allow transmission of messages to a group of nodes simultaneously, but only unconfirmed services are available.

network

a series of stations or nodes connected by some type of communication medium. A network may consist of a single link or multiple links.

node

an address or software location on the network. Also referred to as *node*.

STATUS LED

a bicolor LED, located on the front panel of the coprocessor that indicates the condition of the coprocessor

OD

Object Dictionary. In FMS, an OD is a database within the station, holding the description of all explicit communication objects of that station and making them available for control and monitoring.

open at the initiator

in FMS, a connection type where the source service access point (SAP) is shared among several communication relationships (associated with a different destination address and SAP). The device uses only one of these relationships at a time, depending on the selected remote node.

open at the responder

in FMS, a connection type where the destination address and service access point (SAP) are undefined, thus making the connection available to any device.

OPEN command

in a MSG instruction, establishes a connection between the coprocessor and a remote node on the network

OSI

Open Systems Interconnect. A standard that provides the framework for defining the process of communication between nodes on the PROFIBUS network.

physical layer

The first layer of the seven-layer OSI reference model. This layer is where the coprocessor connects to the network media.



**PICS**

Protocol Implementation Conformance Statement. System conformance requirements associated with network communications, consisting of four parts: implementation and system information, supported services, supported parameters and their options, and local implementation values

**PLC-5™ processor**

Any one of the family of Rockwell Automation Programmable Logic Controllers that support the coprocessor interface: PLC-5/11™ , -5/20™ , -5/30™ , -5/40™ , -5/60™ and -5/80™ .

**PNO**

PROFIBUS Nutzerorganisation, or PROFIBUS User Organization.

**PORT 1 LED**

a bicolor LED, located on the front panel of the coprocessor that indicates the condition of the FMS communication channel of the coprocessor

**PORT 2 LED**

a bicolor LED, located on the front panel of the coprocessor that indicates the condition of the DP communication channel of the coprocessor

**power supply**

module that supplies power to the I/O chassis containing the processor and coprocessor and other modules

**processor**

Any one of the family of Rockwell Automation Programmable Logic Controllers that support the coprocessor interface: PLC-5/11™ , -5/20™ , -5/30™ , -5/40™ , -5/60™ and -5/80™ .

**processor interface**

a 58-pin connector located on the left side of the coprocessor that uses a PLC-5 Connector Header to attach to the processor for communication between the two modules.

**PROFIBUS**

PROcess Field BUS. A German standard (DIN 19245 Parts 1, 2 and 3) that specifies a fieldbus for communications at the process level.

### PROFIBUS Manager

Rockwell Automation PC program that runs under Microsoft® Windows™ version 3.1. This program allows you to create, download and monitor network FMS and DP configurations on your personal computer through an RS-232 interface to your coprocessor.

### program invocation objects

allow an FMS client to place the processor into different modes (for example, program, test, run)

### protocol

the language or packaging of information that is transmitted between nodes on a network.

### qualifier

in a MSG instruction, a word that specifies options for an MSG command

### RFI

Radio Frequency Interference.

### RS-232

communication protocol between the personal computer and the coprocessor

### RS-232 interface

a 9-pin male D-shell connector located at the RS-232 port on the front panel of the coprocessor. Use this interface to connect the Local Station Manager and PROFIBUS Manager installed in your personal computer.

### server

an FMS device that makes resources available for use by another FMS device. Also referred to as *slave*.

### station

an address or software location on the network. Also referred to as *node*.

### SET command

in a MSG instruction, allows transfer of an element, an array of elements or an FMS structure to or from a node on the network.

**slave**

are only allowed to transmit immediate acknowledge or immediate response to master requests. At the Link Layer level, any master can access any slave without restrictions. Also referred to as *passive stations or adapters*.

**STATUS command**

in a MSG instruction, retrieves status information from a remote node and stores it locally.

**system parameters**

allow you to check the current state of the coprocessor

**third party multivendor configurator**

a remote software tool used to define connections between devices and their communication parameters on the network. The tool is available on the open market from many vendors.

**UINFO command**

Unsolicited Variable Information. In a MSG instruction, a command that sends unsolicited data such as an element, array of elements or predefined FMS structure.

**USTAT command**

Unsolicited Status Information. In a MSG instruction, a command that sends unsolicited status information such as an element, array of elements or predefined FMS structure.

**user interface**

three LED indicators located on the front panel of the coprocessor provide the user with the status of the coprocessor and its communication channels. Also referred to as *diagnostics*.

**variable objects**

data that can be accessed from the network within an FMA server.

**VFD**

Virtual Field Device. A portion of the FMS server application process that makes a set of resources (data files, program files, I/O) and their associated functionality available for control and monitoring. For more information on VFDs, refer to DIN 19245 Parts 1 and 2: Process Field Bus.



## 9 ProSoft Technology, Inc., Support, Service & Warranty

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*Be sure and read the full Warranty that can be found on our web site at [www.prosoft-technology.com](http://www.prosoft-technology.com) for details and other terms and conditions. The content in this summary is subject to change without notice. The content is current at date of publication.*

ProSoft Technology, Inc. strives to provide meaningful support to its customers. Should any questions or problems arise, please feel free to contact us at:

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**Internet**Web Site: <http://www.prosoft-technology.com/support>E-mail address: [support@prosoft-technology.com](mailto:support@prosoft-technology.com)

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Those of us at ProSoft Technology, Inc. want to provide the best and quickest support possible, so before calling please have the following information available. You may wish to fax this information to us prior to calling.

- 1 Product Version Number
- 2 System architecture
- 3 Network details

In the case of hardware, we will also need the following information:

- 1 Module configuration and contents of file
- 2 Module Operation
- 3 Configuration/Debug status information
- 4 LED patterns
- 5 Information about the processor and user data files as viewed through the development software and LED patterns on the processor
- 6 Details about the networked devices interfaced, if any

For technical support calls within the United States, an after-hours answering system allows pager access to one of our qualified technical and/or application support engineers at any time to answer your questions.

## 9.1 How to Contact Us: Sales and Support

All ProSoft Technology Products are backed with full technical support. Contact our worldwide Technical Support team and Customer Service representatives directly by phone or email:

### **USA / Latin America (excluding Brasil) (Office in California)**

+1(661) 716-5100  
+1(661) 716-5101 (Fax)  
1675 Chester Avenue, 4th Floor  
Bakersfield, California 93301  
U.S.A.  
+1.661.716.5100, [support@prosoft-technology.com](mailto:support@prosoft-technology.com)  
Languages spoken include: English, Spanish

### **Asia Pacific (office in Malaysia)**

+603.7724.2080  
+603.7724.2090 (Fax)  
C210, Damansara Intan,  
1 Jalan SS20/27, 47400 Petaling Jaya  
Selangor, Malaysia  
+603.7724.2080, [asiapc@prosoft-technology.com](mailto:asiapc@prosoft-technology.com)  
Languages spoken include: Chinese, Japanese, English

### **China Pacific (office in China)**

+86.21.64518356 x 8011  
+86.21.64756957 (Fax)  
4/F, No. 16 Hongcao Road  
Shanghai, China 200233  
China  
+86.21.64518356 x 8011, [zhang@prosoft-technology.com](mailto:zhang@prosoft-technology.com)  
Languages spoken include: Chinese, English

### **Europe / Middle East / Africa (office in Toulouse, France)**

+33 (0) 5.34.36.87.20  
+33 (0) 5.61.78.40.52 (Fax)  
Zone d'activité de Font Grasse  
17, rue des Briquetiers  
F-31700 Blagnac  
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+33 (0) 5.34.36.87.20. support. [EMEA@prosoft-technology.com](mailto:EMEA@prosoft-technology.com)  
Languages spoken include: French, English

### **Brasil (office in Sao Paulo)**

+55-11-5084-5178  
+55-11-5083-3776 (Fax)  
Rua Vergueiro, 2949 - sala 182 - Edifício Vergueiro Work Center  
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Cep: 04101-300 – Brasil  
+55-11-5084-5178, [eduardo@prosoft-technology.com](mailto:eduardo@prosoft-technology.com)  
Languages spoken include: Portuguese, English

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## 9.2 Return Material Authorization (RMA) Policies and Conditions

The following RMA Policies and Conditions apply to any returned product. These RMA Policies are subject to change by ProSoft without notice. For warranty information, see Section C below entitled "Limited Warranty". In the event of any inconsistency between the RMA Policies and the Warranty, the Warranty shall govern.

### 9.2.1 All Product Returns

- 1 In order to return a Product for repair, exchange or otherwise, the Customer must obtain a Returned Material Authorization (RMA) number from ProSoft and comply with ProSoft shipping instructions.
- 2 In the event that the Customer experiences a problem with the Product for any reason, Customer should contact ProSoft Technical Support at one of the telephone numbers listed above in Section A. A Technical Support Engineer will request several tests in an attempt to isolate the problem. If after these tests are completed, the Product is found to be the source of the problem, ProSoft will issue an RMA.
- 3 All returned Products must be shipped freight prepaid, in the original shipping container or equivalent, to the location specified by ProSoft, and be accompanied by proof of purchase. The RMA number is to be prominently marked on the outside of the shipping box. Customer agrees to insure the Product or assume the risk of loss or damage in transit. Products shipped to ProSoft without an RMA number will be returned to the Customer, freight collect. Contact ProSoft Technical Support for further information.
- 4 Out of warranty returns are not allowed on RadioLinx accessories such as antennas, cables, and brackets.

The following policy applies for Non-Warranty Credit Returns:

- A 10% Restocking Fee if Factory Seal is *not* broken
- B 20% Restocking Fee if Factory Seal is broken

ProSoft retains the right, in its absolute and sole discretion, to reject any non-warranty returns for credit if the return is not requested within three (3) months after shipment of the Product to Customer, if the Customer fails to comply with ProSoft's shipping instructions, or if the Customer fails to return the Product to ProSoft within six (6) months after Product was originally shipped.

## 9.3 Procedures for Return of Units Under Warranty

- 1 A Technical Support Engineer must pre-approve all product returns.
- 2 Module is repaired or replaced after a Return Material Authorization Number is entered and a replacement order is generated.
- 3 Credit for the warranted item is issued within 10 business days after receipt of product and evaluation of the defect has been performed by ProSoft. The credit will only be issued provided the product is returned with a valid Return Material Authorization Number and in accordance with ProSoft's shipping instructions.
  - a) If no defect is found, a credit is issued.

- b) If a defect is found and is determined to be customer generated or if the defect is otherwise not covered by ProSoft's Warranty, or if the module is not repairable, a credit is not issued and payment of the replacement module is due.

## 9.4 Procedures for Return of Units Out of Warranty

- 1 Customer sends unit in for evaluation.
- 2 If no defect is found, Customer will be charged the equivalent of US \$100 plus shipping, duties and taxes that may apply. A new Purchase Order will be required for this evaluation fee.  
If the unit is repaired the charge to the Customer will be 30%\* of the list price plus any shipping, duties and taxes that may apply. A new Purchase Order will be required for a product repair.
- 3 For an immediate exchange, a new module may be purchased and sent to Customer while repair work is being performed. Credit for purchase of the new module will be issued when the new module is returned in accordance with ProSoft's shipping instructions and subject to ProSoft's policy on non-warranty returns. This is in addition to charges for repair of the old module and any associated charges to Customer.
- 4 If, upon contacting ProSoft Customer Service, the Customer is informed that unit is believed to be unrepairable, the Customer may choose to send unit in for evaluation to determine if the repair can be made. Customer will pay shipping, duties and taxes that may apply. If unit cannot be repaired, the Customer may purchase a new unit.

### 9.4.1 Un-repairable Units

- 3150-All
- 3750
- 3600-All
- 3700
- 3170-All
- 3250
- 1560 can be repaired, if defect is the power supply
- 1550 can be repaired, if defect is the power supply
- 3350
- 3300
- 1500-All

**\* 30% of list price is an estimated repair cost only. The actual cost of repairs will be determined when the module is received by ProSoft and evaluated for needed repairs.**



### **9.4.2 Purchasing Warranty Extension**

As detailed below in ProSoft's Warranty, the standard Warranty Period is one year (or in the case of RadioLinx modules, three years) from the date of delivery. The Warranty Period may be extended for an additional charge, as follows:

- Additional 1 year = 10% of list price
- Additional 2 years = 20% of list price
- Additional 3 years = 30% of list price

## **9.5 LIMITED WARRANTY**

This Limited Warranty ("Warranty") governs all sales of hardware, software and other products (collectively, "Product") manufactured and/or offered for sale by ProSoft, and all related services provided by ProSoft, including maintenance, repair, warranty exchange, and service programs (collectively, "Services"). By purchasing or using the Product or Services, the individual or entity purchasing or using the Product or Services ("Customer") agrees to all of the terms and provisions (collectively, the "Terms") of this Limited Warranty. All sales of software or other intellectual property are, in addition, subject to any license agreement accompanying such software or other intellectual property.

### **9.5.1 What Is Covered By This Warranty**

- A** *Warranty On New Products:* ProSoft warrants, to the original purchaser only, that the Product that is the subject of the sale will (1) conform to and perform in accordance with published specifications prepared, approved, and issued by ProSoft, and (2) will be free from defects in material or workmanship; provided these warranties only cover Product that is sold as new. This Warranty expires one year (or in the case of RadioLinx modules, three years) from the date of shipment (the "Warranty Period"). If the Customer discovers within the Warranty Period a failure of the Product to conform to specifications, or a defect in material or workmanship of the Product, the Customer must promptly notify ProSoft by fax, email or telephone. In no event may that notification be received by ProSoft later than 15 months (or in the case of RadioLinx modules, 39 months) from the date of delivery. Within a reasonable time after notification, ProSoft will correct any failure of the Product to conform to specifications or any defect in material or workmanship of the Product, with either new or used replacement parts. Such repair, including both parts and labor, will be performed at ProSoft's expense. All warranty service will be performed at service centers designated by ProSoft. If ProSoft is unable to repair the Product to conform to this Warranty after a reasonable number of attempts, ProSoft will provide, at its option, one of the following: a replacement product, a full refund of the purchase price or a credit in the amount of the purchase price. All replaced product and parts become the property of ProSoft. These remedies are the Customer's only remedies for breach of warranty.

- B** *Warranty On Services:* Material and labor used by ProSoft to repair a verified malfunction or defect are warranted on the terms specified above for new Product, provided said warranty will be for the period remaining on the original new equipment warranty or, if the original warranty is no longer in effect, for a period of 90 days from the date of repair.
- C** The Warranty Period for RadioLinx accessories (such as antennas, cables, brackets, etc.) are the same as for RadioLinx modules, that is, three years from the date of shipment.

### **9.5.2 What Is Not Covered By This Warranty**

- A** ProSoft makes no representation or warranty, expressed or implied, that the operation of software purchased from ProSoft will be uninterrupted or error free or that the functions contained in the software will meet or satisfy the purchaser's intended use or requirements; the Customer assumes complete responsibility for decisions made or actions taken based on information obtained using ProSoft software.
- B** With the exception of RadioLinx accessories referenced in paragraph 1(c) this Warranty does not cover any product, components, or parts not manufactured by ProSoft.
- C** This Warranty also does not cover the failure of the Product to perform specified functions, or any other non-conformance, defects, losses or damages caused by or attributable to any of the following: (i) shipping; (ii) improper installation or other failure of Customer to adhere to ProSoft's specifications or instructions; (iii) unauthorized repair or maintenance; (iv) attachments, equipment, options, parts, software, or user-created programming (including, but not limited to, programs developed with any IEC 61131-3 programming languages, or "C") not furnished by ProSoft; (v) use of the Product for purposes other than those for which it was designed; (vi) any other abuse, misapplication, neglect or misuse by the Customer; (vii) accident, improper testing or causes external to the Product such as, but not limited to, exposure to extremes of temperature or humidity, power failure or power surges outside of the limits indicated on the product specifications; or (viii) disasters such as fire, flood, earthquake, wind or lightning.
- D** The information in this Agreement is subject to change without notice. ProSoft shall not be liable for technical or editorial errors or omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance or use of this material. The user guides included with your original product purchased by you from ProSoft, contains information protected by copyright. No part of the guide may be duplicated or reproduced in any form without prior written consent from ProSoft.

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### ***9.5.3 DISCLAIMER REGARDING HIGH RISK ACTIVITIES***

**PRODUCT MANUFACTURED OR SUPPLIED BY PROSOFT IS NOT FAULT TOLERANT AND IS NOT DESIGNED, MANUFACTURED OR INTENDED FOR USE IN HAZARDOUS ENVIRONMENTS REQUIRING FAIL-SAFE PERFORMANCE (INCLUDING, WITHOUT LIMITATION, THE OPERATION OF NUCLEAR FACILITIES, AIRCRAFT NAVIGATION OF COMMUNICATION SYSTEMS, AIR TRAFFIC CONTROL, DIRECT LIFE SUPPORT MACHINES OR WEAPONS SYSTEMS), IN WHICH THE FAILURE OF THE PRODUCT COULD LEAD DIRECTLY OR INDIRECTLY TO DEATH, PERSONAL INJURY, OR SEVERE PHYSICAL OR ENVIRONMENTAL DAMAGE (COLLECTIVELY, "HIGH RISK ACTIVITIES"). PROSOFT SPECIFICALLY DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR HIGH RISK ACTIVITIES.**

### ***9.5.4 DISCLAIMER OF ALL OTHER WARRANTIES***

**THE WARRANTIES SET FORTH IN PARAGRAPH 1 ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

### ***9.5.5 LIMITATION OF REMEDIES\*\****

**IN NO EVENT WILL PROSOFT (OR ITS DEALER) BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES BASED ON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY. DAMAGES THAT PROSOFT AND ITS DEALER WILL NOT BE RESPONSIBLE FOR INCLUDE, BUT ARE NOT LIMITED TO: LOSS OF PROFITS; LOSS OF SAVINGS OR REVENUE; LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT; LOSS OF DATA; COST OF CAPITAL; COST OF ANY SUBSTITUTE EQUIPMENT, FACILITIES, OR SERVICES; DOWNTIME; THE CLAIMS OF THIRD PARTIES, INCLUDING CUSTOMERS OF THE PURCHASER; AND INJURY TO PROPERTY.**

**\*\* Some areas do not allow time limitations on an implied warranty, or allow the exclusion or limitation of incidental or consequential damages. In such areas the above limitations may not apply. This Warranty gives you specific legal rights, and you may also have other rights which vary from place to place.**

### ***9.5.6 Time Limit for Bringing Suit***

**Any action for breach of warranty must be commenced within 15 months (or in the case of RadioLinx modules, 39 months) following shipment of the Product.**

### **9.5.7 No Other Warranties**

Unless modified in writing and signed by both parties, this Warranty is understood to be the complete and exclusive agreement between the parties, suspending all oral or written prior agreements and all other communications between the parties relating to the subject matter of this Warranty, including statements made by salesperson. No employee of ProSoft or any other party is authorized to make any warranty in addition to those made in this Warranty. The Customer is warned, therefore, to check this Warranty carefully to see that it correctly reflects those terms that are important to the Customer.

### **9.5.8 Intellectual Property**

- A** Any documentation included with Product purchased from ProSoft is protected by copyright and may not be photocopied or reproduced in any form without prior written consent from ProSoft.
- B** ProSoft's technical specifications and documentation that are included with the Product are subject to editing and modification without notice.
- C** Transfer of title shall not operate to convey to Customer any right to make, or have made, any Product supplied by ProSoft.
- D** Customer is granted no right or license to use any software or other intellectual property in any manner or for any purpose not expressly permitted by any license agreement accompanying such software or other intellectual property.
- E** Customer agrees that it shall not, and shall not authorize others to, copy software provided by ProSoft (except as expressly permitted in any license agreement accompanying such software); transfer software to a third party separately from the Product; modify, alter, translate, decode, decompile, disassemble, reverse-engineer or otherwise attempt to derive the source code of the software or create derivative works based on the software; export the software or underlying technology in contravention of applicable US and international export laws and regulations; or use the software other than as authorized in connection with use of Product.

### **9.5.9 Additional Restrictions Relating To Software And Other Intellectual Property**

In addition to complying with the Terms of this Warranty, Customers purchasing software or other intellectual property shall comply with any license agreement accompanying such software or other intellectual property. Failure to do so may void this Warranty with respect to such software and/or other intellectual property.

### **9.5.10 Allocation of risks**

This Warranty allocates the risk of product failure between ProSoft and the Customer. This allocation is recognized by both parties and is reflected in the price of the goods. The Customer acknowledges that it has read this Warranty, understands it, and is bound by its Terms.

**9.5.11 Controlling Law and Severability**

This Warranty shall be governed by and construed in accordance with the laws of the United States and the domestic laws of the State of California, without reference to its conflicts of law provisions. If for any reason a court of competent jurisdiction finds any provisions of this Warranty, or a portion thereof, to be unenforceable, that provision shall be enforced to the maximum extent permissible and the remainder of this Warranty shall remain in full force and effect. Any cause of action with respect to the Product or Services must be instituted in a court of competent jurisdiction in the State of California.



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