825 Application MSCALE (Multi Scale) June 14, 2011

Use this application document in conjunction with the 825 Operation Manual and existing addendums for a complete understanding of system operation.

HARDWARE REQUIREMENTS

Cardinal 825 weight indicator with up to 10 SIB cards.

INDICATOR OPERATION

The weight indicator must be loaded with the multi scale Ethernet/IP application software "mscaleeip".



The display will appear differently for different numbers of scales.



The application is the same the standard MSCALE multiple scale application with the addition of the EIP protocol.

Press any scale button for a detailed view of the selected scale.



PRESETS

Set	Set Presets						
Ena	able	Weight	Label		Text	Back	Out
1:	YES	5000	Under		Blk	Yel	0
2 :	YES	12500	Small		Blk	Cyan	0
3:	YES	15000	Ok		Blk	Grn	0
4 :	YES	22500	Large		Blk	Blue	0
5:	YES	27000	Over		Blk	Red	0

Up to 5 presets may be enabled. Specify the "Weight" cut-off for each preset. A "Label" may be specified. This label will also show in the main screen for each scale. "Text" and "Back" colors may be specified by selecting the appropriate input and press the "SPACE" key to cycle through the available options. An "Out" output relay may be specified to drive and output when the specified condition is true. After making changes to the screen press ENTER to save the changes.

ZERO

Press the "ZERO" button to zero the scale.

KB TARE

Press the "KB TARE" button for keyboard tare.

```
Set Tare
Tare: 2.3
Enter the tare weight to be subtracted
from the gross weight to obtain the net
weight.
```

Type the tare weight and press ENTER. This display will automatically show "GROSS" "TARE" and "NET" weights.



PB TARE

The "PB TARE" button performs a push button tare operation setting the tare weight to equal the current gross weight.



GROSS/NET

The "GROSS" or "NET" button is used to switch the display mode between gross and gross, tare, net weight.

UNITS

The "UNITS" button toggles between primary and secondary units such as "lb" and "kg" if secondary units are configured in calibration/setup.



ID

The "ID" button allows an ID value to be entered.



This value will may print on the ticket output if the ticket output is configured to print the ID.

PRINT

The "PRINT" button will send the current time/date, ID and weights to the printer. The output is based on the "Configuration" printer tabs.

EXIT

The "EXIT" button will return to the main screen showing all of the scale weights.

MENU

The setup menu contains an additional setup item for "EIP".

Menu	
1. Set date and time	
2. View Accumulators	
3. Clear Accumulators	
5. Language	
E. EIP	
	EXIT

Select the "EIP" option to configure EIP communications.

1. Set Date/Time

Set Date	/Time
Year:	2011
Month:	7
Day:	18
Hour:	13
Minute:	22
Second:	42
Enter th	ne year

Use the "Up" and "Down" navigation keys to select any items to change and type the desired values. The "Hour" is entered in 24 hour format regardless of whether the display is set for 12 or 24 hour format. When the desired date and time is entered press the ENTER key to save changes.

2. View Accumulators



Based on the print operation the "Count" of how many loads is shown, the "Gross Accumulation" shows accumulated gross weight. "Net Accumulator" shows accumulated net weight. Press any key to return to the menu.

3. Clear Accumulators

```
Clear Accumulators
Are you sure you want to clear?
```

Press "Y" to confirm that accumulators are to be cleared.

```
Clear Accumulators
Are you sure you want to clear?
Accumulators Cleared
Press any key
```

4. Language



Toggle the language between English and Spanish. The display will automatically return to the main screen in order to refresh all of the test. Press "MENU" to and "Language" again to return to "English".

E. EIP

EIP Se	tup	
Enable	EIP:	Yes
Weight	data	format: Float
Weight	byte	A index: 0
Weight	byte	B index: 1
Weight	byte	C index: 2
Weight	byte	D index: 3
Y = Ye:	5 N =	No

This "Enable EIP:" prompt will allow EIP communications to be enabled or disabled.

The "Weight data format:" prompts allows the weight value to be sent from the 825 as an integer or float. Press "SPACE" to toggle the selection. If integer is selected the output

will have an assumed decimal place. For example, a weight of 10.5 with a calibration having two decimal places will be output as 1050.

The "Weight data byte A index:" through "Weight data byte D index:" prompts allow the weight value output bytes to be output in any order. The default order is bytes A, B, C, D bytes to be output in position 0, 1, 2, or 3 to match the 2XX-EIP formst.

The desired settings are specified press ENTER to save the settings. The settings will not take effect until the application is exited and restarted. Press SHIFT then ESC repeatedly to back out of the application to return to the application menu. Then restart the application.

Address	Description			
Byte 0	Scale 1 weig	ht 0		
Byte 1	Scale 1 weig	ht 1		
Byte 2	Scale 1 weig	ht 2		
Byte 3	Scale 1 weig	ht 3		
Byte 5	Scale 1 status byte may contain combinations of the			
	following:			
	Bit 0	Motion		
	Bit 1	Below Zero		
	Bit 2	Center of Zero		
	Bit 3	Over Capacity		
	Bit 4	Units $0 = $ std, $1 = $ converted		
	Bit 5	Mode $0 = \text{gross}, 1 = \text{net}$		
	Bit 6	Not defined		
	Bit 7	Weight Error		
Byte 6	Not used			
Byte 7	Not used			
Byte 8-15	Scale 2 weig	ht and status		
Byte 16-23	Scale 3 weig	ht and status		
Byte 24-31	Scale 4 weig	ht and status		
Byte 32-39	Scale 5 weig	ht and status		
Byte 40-47	Scale 6 weig	ht and status		
Byte 48-55	Scale 7 weig	ht and status		
Byte 56-63	Scale 8 weig	ht and status		
Byte 64-71	Scale 9 weig	ht and status		
Byte 72-79	Scale 10 wei	ght and status		

The output address format is:

The input address format is:

Address	Description
Byte 0	Scale 1 command byte:

	Bit 0	Gross/Net
	Bit 1	Not defined
	Bit 2	Zero Scale
	Bit 3	PB Tare
	Bit 4	KB Tare (value in bytes 4,5,6,7)
	Bit 5	Not defined
	Bit 6	Not defined
	Bit 7	Not defined
Byte 8	Scale 2 com	nand byte
Byte 16	Scale 3 com	nand byte
Byte 24	Scale 4 com	mand byte
Byte 32	Scale 5 com	mand byte
Byte 40	Scale 6 com	mand byte
Byte 48	Scale 7 com	mand byte
Byte 56	Scale 8 com	mand byte
Byte 64	Scale 9 com	mand byte
Byte 72	Scale 10 con	nmand byte

CONFIGURE THE PLC USING RSLogix5000

Either create a new project or use an existing, set the program in "Offline" mode. Add the module to the configuration in the PLC. Start by right click the EtherNet/IP module/bridge in the I/O configuration, and select "New Module".

& RSLogix 5000 - CLOGIX5000 [1756-L55]		
Offline I. FUN No Forces I. BAT No Edit A. FUN Redundancy I. C.	Patr AB_ETH-11/10.10.14.80xBackplane/0 H H H <td< td=""><td></td></td<>	
Controller CLOGX5000 Controller Tags Controller Faut Handler Controller Faut Handler Controller Faut Handler Controller Faut Handler Controller Fauther Controller Contro	Predefined Module-Defined Module-Defined I/O Configuration I/O Co	Vet odule Ctrl+X Ctrl+C
Generation	Paste Delete Cross R	Ctrl+V Del
B] [3]1756< KWW MODUL Cut Chrl+X Copy Chrl+C Pasta Chrl+V Pasta Chrl+V	Description Print Module Fault Propert	Ctrl+P
Cross Reference ChrHE		
Description Print Otrian Module Fault Properties		
Create a module		

Now a dialogue window will appear. In this dialogue window, select "Generic Ethernet module" and press OK.

ype:	Major Revision:			
THERNET-MODULE	1 💌			
уре	Description			
734-AENT/A	1734 Ethernet Adapter, Twisted-Pair Media			
756-ENBT/A	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media			
756-ENET/A	1756 Ethernet Comm 1734 Ethernet Adapter, Twisted-Pair Media			
756-ENET/B	1756 Ethernet Bridge			
788-ENBT/A	1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media			
1794-AENT/A 1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media				
ETHERNET-MODULE Generic Ethernet Module				
Contract of the Contract of th				
Show Vendor: All	✓ Other I Specialty I/O Select Al			

In the next dialogue window, RSLogix 5000 will ask for information regarding the

communication to the module. First enter a name for the module. This name will create a tag in RSLogix5000, which can be used to access the memory location in the PLCs memory where the data for the module will be stored. With the name entered, press Next.

Type: Vendor: Parent:	ETHERNET-MODULE Generic Ether Allen-Bradley Cardinal Ethernet Bridge	net Module		
Name: Description:	Cardinal_220	Connection Para	ameters Assembly Instance:	Size:
		Input: Output:	100	8 ÷ (8-bit) 8 ÷ (8-bit)
Comm Forma Address / H	t Data - SINT 💽	Configuration:	1	0 ÷ (8-bit)
IP Add O Host N	ess: 10 . 10 . 14 . 2	Status Input: Status Output		

In the next dialogue box enter a value for the time between each scan of the module, called Request Packet Interval (RPI). Make sure that "Inhibit Module" isn't checked. After this, press Finish.

Requested Packet In	terval (BPI):	50.0 ms (1.0	- 3200.0 ms)	
Tinhibit Module	and the first of t		0200.0 110)	
Major Fault On Co	ntroller If Connectio	n Fails While in Ru	n Mode	
- Module Fault				

Now the module has been added to the I/O configuration in RSLogix5000. The main screen will look as follows.

Bitstegts 5000 - Cardinal_Scale in Cardinal_Scale Re 65 Web Stack Logic Commissions Took Web Debug Stack Logic Commissions Took Web Debug Stack Logic Commissions Debug Stack Logic Debug	20_19_AC0 (475-64.55) × 1949 State of the second	
Controler no. Controler no. Controler no. The der Controler no. Controler no. The der Controler no. The der Controler no. The der Controler no. The der Controler no. Controler no. The der Controler no. Controler no. Controler Controler Controler Controler Controler Con		Predefined Module-Defined JO Configuration I/O Configuration I/I 1756-ENBT/A Cardinal_Ethernet_Bridge I/I 21756-ENB/D Cardinal_Scale_Control_Net I/I 21756-CNB/D Cardinal_Scale_Control_Net I/I 2 CONTROLNET-MODULE Cardinal_220_DP
K 175L155 Coltral ugidoss Coltrale Bat 9 Macritan Macritan K 2		

Now go online and download the configuration to the PLC.

- **1.** Select Go Online in the communication menu.
- 2. A new window will open.
- 3. Select download.

4. A new window will popup with the question if you actually want to download the configuration.

5. Select "Download". The configuration will now be downloaded to the PLC.

Now it's possible to access the data exchanged by ControlLogix5000 and the module. To do this, open the "Controller Tags" window and go to monitor tags. Three tags named "Cardinal_2XX:C", "Cardinal_2XX:I" and "Cardinal_2XX:O" should be visible, representing the three instances configuration, input and output. The configuration instance will be created even if we selected zero as its size. The Cardinal_2XX:I tag is data coming from the module and Cardinal_2XX:O tag holds data going to the module.

laginame V	Value 🔸	Force Mask 🛛 🗲	Style	Туре	Description
+ Cardinal_220:C] {}	{}		AB:ETHERNET	Weight
- Cardinal_220:1	{}	{}		AB:ETHEBHET	reight
😑 Cardinal_220:1.Data	{}	{}	Decimal	SINT[8]	Weight Statu
+ Cardinal_220:1.Data[0]	16#44	_	Hex	SINT	Theight Glate
+ Cardinal_220:1.Data[1]	16#95	-	Hex	SINT	PWC Status
+ Cardinal_220:I.Data[2]	16#a0		Hex	SINT	- no status
+ Cardinal_220:1.Data[3]	16#00		Hex	SINT	CMD 0 rotur
+ Cardinal_220:1.Data[4]	2#0000_0000		Binary	SINT	when comple
+ Cardinal_220.1.Data[5]	2#0000_0000	-	Binary	SINT	when comple
+ Cardinal_220:I.Data[6]	0	*	Decimal	SINT	CMD 1 rotur
+ Cardinal_220:1.Data[7]	0	<	Decimal	SINT	when compl
- Cardinal_220:0	{}	()		AB:ETHERNET	when comple
- Cardinal_220:0.Data	{}	()	Decimal	SINT[8]	CMD 0
+ Cardinal_220:0.Data[0]	2#0000_0000	←	Binary	SINT	
+ Cardinal_220:0.Data[1]	2#0000_0000	←	Binary	SINT	CMD 1
+ Cardinal_220:0.Data[2]	0	7-	Decimal	SINT	
+ Cardinal_220:0.Data[3]	0		Decimal	SINT	N/A
+ Cardinal_220:0.Data[4]	16#46	<	Hex	SINT	
	16#ea	*	Hex	SINT	Eleat Bute 0
+ Cardinal_220:0.Data[5]		*	Hex	SINT	Float Byte o
+ Cardinal_220:0.Data[5]	16#60				

Input:

The weight data begins at Data[0] and uses the next four bytes to produce a floating point program tag.

Float = (Data[0], Data[0])	ta[1], Data[2	2], Data[3])		
WEIGHT_220	2000.0		Float	REAL	

Test using Pyramid Solutions EIP Scan:

1. Record the IP address and open the EIPScan Test Tool.

🚇 EIPScan Test Tool - Untitled	
File View Network Request I/O Help	
Request (all fields, but IP addresses are in hex) Service (hex) Class (hex) Instance (hex) Attribute (hex) Member (hex) Symbol Tag Request Data. Each byte is a 2 char hex value, separated by a space [i.e. 0a 26 f9].	
Timestamp Message	
10:16:40:919 Ethermet/IP Scanner Library is online	
	>
Ready	

- 2. Right click in the network area and select "Add Device"
- 3. Now a dialogue window will appear. Enter the IP address of the 825.

Add New Devic	X	
IP Address		ОК
		Cancel

4. The 825 Ethernet/IP module will appear in the network area.



5. Right click on the module and select Add Connection.



6. A new dialogue window will appear, configure the Type tab as shown:

Add Connection		
Type Data Size Rate	Trigger Destination Priority	
Connection Type	Transport Type	
Class 1	Originator -> Target	Point To Point 💌
C Class 3	Target -> Originator	Point To Point 💌
	ОК	Cancel Apply

7. Click on the Data Size tab and configure as shown:

Add Connection		×
Type Data Size Rate	Trigger Destination Priority	и)
Originator->Target Data Size 80	🔽 Run/Idle Header	
Target->Originator Data Size 80	🔲 Run/Idle Header	
L		
	OK	Cancel Apply

8. Click on the Rate tab and configure as shown:

Add Connection		
Type Data Size Rate T	rigger Destination Priority	
Packet Rate in milliseconds		
Originator -> Target	100	
Target -> Originator	100	
Production Inhibit Timeout ir	n milliseconds	
Originator -> Target	0	
Target -> Originator	0	
	OK Cancel A	pply

9. Click on the Trigger tab and configure as shown:

Add Connection		×
Type Data Size Rate	Trigger Destination Priority	
Transport Trigger	Cyclic	
Timeout Multiplier	16 💌	
	OK Cancel Apply	

10. Click on the Destination tab and configure as shown:

Add Connection	
Type Data Size Rate Trigger Destin	ation Priority
Configuration Connection Instance	
Originator->Target Connection Point	50
Target->Originator Connection Point	00
Connection Tag	
	OK Cancel Apply

11. Click on the Priority tab and configure as shown:

Add Connection		×
Type Data Size Rate	Trigger Destination Priority	
Originator -> Target	Scheduled 🔽	
Target -> Originator	Scheduled	
	OK Cancel	Apply

12. Click OK

13. After the configuration is completed the data will show up in the display window. The data in blue will be the incoming weight and status bits and the data in green is the output commands. The weight is displayed in the first four bytes (10000 lb in the default float output format will read 46 1C 40 00)

		EIP:	Scar	n Te s	st Ti 2.21	ool																												
	Ether	rNeţ	/IP A	.dap 4	oter l 0	_ibra	ary ⊕ 15	⊕ € 14 1: (→ ()	€ 3 12 → ⊖•	⊕ • 11 1 •⊖•(€ 09 ≯⊖	⊕	⊕ € 7 6 ⊖• C	> • •	⊕ • 4	⊕ ⊕ 3 2 ≯ ⊖		⊕ □ ᠿ]															
00 C 00 C	3c 00	a7 00	00 00	00 00	00 00	00 00	00 00	00 00	51 00	82 00	00 00	00 00	00 00	00 00	00 00	00 00	29 00	7f 00	00 00	00 00	00 00	00 00	00 00	00 00	47 00	4d 00	00 00	^						
00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	^ ~

- 1. Set the weight simulator dial to display 10000 lb on the indicator.
- 2. When changing the weight simulator dial, observe the 5th input byte it should change to 01h when there is motion.
- 3. Highlight the first byte of the output data and type a 4 (Zero Scale Command).



- 4. The weight display of the indicator should zero and the 5th byte of the input data should read 04h to indicate the indicator is at center of zero.
- 5. Type over the 04h in the output data to return it to 00h.
- 6. Set the weight simulator dial to .2mV/V and send the zero scale command again.
- 7. Type over the 04h in the output data to return it to 00h.