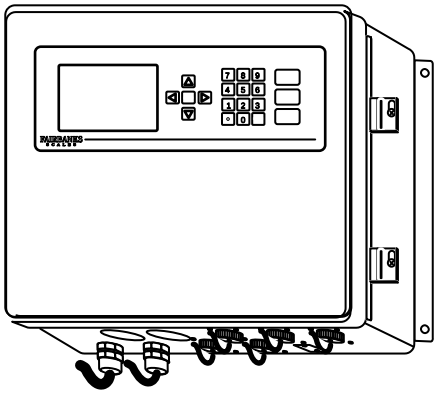
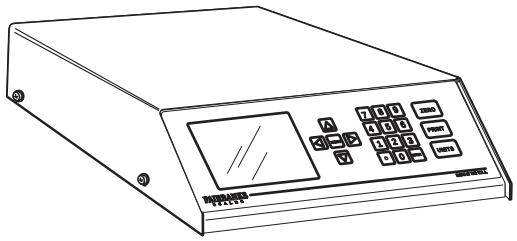
Service / Installation Manual

Fieldbus

Interfaces for IND-(H) R2500 Instruments with Intalogix™ Technology





50509
Revision 5 9/07

Amendment Record

Fieldbus
Interfaces for IND-(H)R2500
Instruments with Intalogix™ Technology
50509 (SJ 4801)

Manufactured by Fairbanks Scales Inc.
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Created	12/98	
Issue #1	02/99	New Product Release
Issue #2	02/04	Added fieldbus menu programming, details of data and byte location, and appendices
Issue #3	01/06	Added software Revision requirements
Issue #4	12/06	Added “AB RIO RS Works Example” information, including LAD 2 information, updated Parts List, and added “Top-of-Tree” schematics.
Revision 5	10/07	Updated specifications

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Interfaces for IND-(H)R2500
Instruments with Intalogix™ Technology
50509/SJ4801

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Disclaimer

Every effort has been made to provide complete and accurate information in this manual. However, although this manual may include a specifically identified warranty notice for the product, Fairbanks Scales makes no representations or warranties with respect to the contents of this manual, and reserves the right to make changes to this manual without notice when and as improvements are made.

Section 1: General Information

A. Introduction

Fieldbus is a general term that describes an all-digital two-way communications system that interconnects measurement and control equipment such as sensors, actuators and controllers.

Fieldbus traces its beginnings to the automotive industry, where efforts to simplify and reduce wiring resulted in a multiplexed **CAN** (**C**ontroller **A**rea **N**etwork) system of modules installed at various points of a vehicle.

For example, many cars have multiple controls on the door, such as power-window, power-mirror, power-lock and even power-seat controls. To eliminate the thick bundle of wires of the older method, a driver's-door module monitors all of the switches. If the driver presses the window switch, the door module closes a relay that provides power to the window motor. If the driver presses the switch to adjust the passenger-side mirror, the driver's door module sends a packet of data onto the communication bus of the car. This packet tells a different module to energize one of the power-mirror motors. In this way, most of the signals that leave the driver's door are consolidated onto the two wires that form the communication bus.

As time has progressed, many different Fieldbus types have appeared on the market place, each with different characteristics and specifications. Very simply, they serve as a Local Area Network (LAN) for instrumentation used in automatic process control and manufacturing applications.

The LAN is a digital, bi-directional, multidrop, serial-bus communications network used to link isolated field devices (often referred to as “Nodes”) such as controllers, transducers, actuators and sensors. Each field device has low cost computing power installed within it, making each device a 'smart' device. Each device is capable of executing simple functions on it's own such as self-diagnostic, control, and maintenance functions. As a result it can report if there is a failure of the device or that manual calibration is required, this increases the efficiency of the system and reduces the amount of maintenance required.

There are a number of different manufacturers that produce Fieldbus devices, and therein lie differences in the type of interface hardware used, the wiring and type of connectors, speed, and the amount of bytes of data that can be exchanged on the network, among other things.

Additionally, the Fieldbus communications network replaces the older 4-20mA analog signal. Whereas the 4-20 mA analog signal requires each device to have its own set of wires and its own connection points, a Fieldbus eliminates this need as, generally, twisted pair wiring is used, and all devices on the network are connected together.

Fairbanks will utilize one of several different factory installed cards and specific software (or prom) for meeting these applications.

B: FIELDBUS TYPES

ANYBUS

The AnyBus-DT Data Transfer module can handle large amount of data and parameters that are transferred over a fieldbus network. The amount of data that can be sent and received by the AnyBus module depends on the fieldbus network that is used.

If the default set is active, 64 bytes of input and 64 bytes of output information can be handled. Since for some applications this amount of data will not be sufficient, it is possible to change the amount of data which can be handled by the DataTransfer module.The module has a 1kB DPRAM. The maximum amount of data which can be handled by the Data Transfer module is 480 bytes of input data and 480 bytes of output data. Some fieldbus systems can not support large amount of data and can not be configured for the maximum 480 bytes of data inputs/outputs.

AnyBus DT Vs AnyBus-S

The AnyBus-DT range was designed for complex applications which required more features than the standard AnyBus I/O could deliver. However to be able to support all upgrades and features of each industrial network, greater performance and ability was needed. This is the reason why the AnyBus-DT was superceded.

Since 1994, AnyBus has grown into a complete product range, supplying the industry manufacturers with a product supporting Profibus-DP, DPV1, PROFIdrive, DeviceNet, Industrial Ethernet, EtherNet/IP, CC-Link, Interbus, CANopen, LonWorks, Modbus Plus, ControlNet, AS-Interface, Allen Bradley Remote I/O, FIPIO and Modbus RTU.

PROFIBUS

ProfiBus is one of the best-known industrial fieldBus protocols from Europe. ProfiBus can be used in a very wide range of applications as a multi-application communications link for industrial devices. ProfiBus is an established standard, first introduced in 1989. The ProfiBus protocol was originally developed by a committee founded by the German government.

ProfiBus utilizes a non-powered two-wire (RS485) network. A ProfiBus network may have up to 126 nodes. It can transfer a maximum of 244 bytes data per node per cycle. Communication (baud) rates are selectable but overall end-to-end network distance varies with speed. Maximum Communication (baud) rate is 12Mbps with a maximum distance of 100M (328ft). The maximum distance is 1200M (3936 ft) at 93.75Kbps without repeaters. ProfiBus connects to a wide variety of field devices including discrete and analog I/O, drives, robots, HMI/MMI products, pneumatic valves, barcode readers, weigh scales, transducers, and flow measuring equipment.

INTERBUS

InterBus from Phoenix Contact is an open systems approach to a high performance, ring-based, distributed device network for manufacturing and process control. InterBus is a "master to many" slave device network.

This protocol is optimized for the throughput demands required by sensor/actuator networks. I/O data is transmitted in frames that provide simultaneous and predictable updates to all devices on the network. The InterBus serial protocol is implemented as remote and local bus types. The remote bus is used for long distance transfer of data, up to 1300 feet. Output from the IBS controller board starts the first remote bus. No power passes through the remote bus cable. Electrical voltage levels are RS-485, and the network operates at 500k baud, full duplex.

CAN OPEN

CANopen is a network concept based on the serial bus system Controller Area Network (CAN) and the application layer CAN Application Layer (CAL). Developed originally for passenger cars, the CAN two-wire bus system is already in use in over one million industrial control devices, sensors and actuators. Hallmarks of the internationally standardized bus system are its simplicity, high transmission reliability and extremely short reaction times. Many major semiconductor manufacturers sell CAN chips, and the fact that millions of them are used in automobiles guarantees low chip prices and long-term availability. CANopen permits both cyclic and event-controlled communication. This makes it possible to reduce the bus load to a minimum and achieve high communication performance at relatively low baud rates. Among the distinguishing features of CANopen are its support for data transport at the supervisory control level as well as integration of very small sensors and actuators in one physical network. In this way CANopen allows both simple and complex devices to be networked.

DEVICE NET

DeviceNet is a low-cost communications link that connects industrial devices to a network and eliminates expensive hardwiring. It is based on a broadcast-oriented, communications protocol the Controller Area Network (CAN). The CAN protocol was originally developed by BOSCH for the European automotive market for replacing expensive wire harnesses with low-cost network cable on automobiles. As a result, the CAN protocol has fast response and high reliability for applications as demanding as control of anti-lock brakes and air bags.

DeviceNet also provides power on the network. This allows devices with limited power requirements to be powered directly from the network, reducing connection points and physical size. The network size can be up to 64 Nodes, with message data packets up to 8 bytes in size.

MODBUSPLUS

The Modbus protocol was originally developed in 1978 to exchange information between devices on the factory floor. This protocol developed into the standard for exchanging data and communication information between PLC systems. Modbus devices communicate over a serial network in a master/slave (request/response) type relationship using one of two transmission modes: ASCII (American Standard Code for Information Interchange) mode or RTU (Remote Terminal Unit) mode.

In ASCII mode, two eight-bit bytes of information are sent as two ASCII characters. The primary advantage of ASCII mode is the flexibility of the timing sequence. Up to a one second interval can occur between character transmissions without causing communication errors.

In RTU mode, data is sent as two four-bit, hexadecimal characters, providing for higher throughput than in ASCII mode for the same baud rate. Modbus Plus communicates via a single twisted pair of wires in one shielded cable #18AWG. Modbus Plus does NOT provide power on the network. The network size can be up to 32 Nodes (up to 64 with repeater).

CONTROL NET

The Control Net network is an open control network that meets the demands of real-time, high-throughput applications. The ControlNet network uses a Control and Information Protocol (CIP) to combine the functionality of an I/O network and a peer-to-peer network.

Supports a maximum of 99 nodes, with no minimum distance between nodes

ControlNet is based on the Producer/Consumer model, which permits all nodes on the network to simultaneously access the same data from a single source. Card with Rev 1.50 software or greater; the instrument must have software 24705, Rev 9.3.

ETHERNET

Ethernet, first developed in 1973 by Xerox Corporation, is the most popular LAN in the world. Industry estimates indicate that as of 1994 over 40 million Ethernet nodes had been installed worldwide. The widespread popularity of Ethernet ensures that there is a large market for Ethernet equipment, which also helps keep the technology competitively priced.

Ethernet networks computers in a LAN using copper cabling, and will handle about 10,000,000 bits-per-second and can be used with almost any kind of computer. Twisted-pair Ethernet uses an RJ-45 connector, which is an eight-pin modular connector.

MITSUBISHI COM3

This is only used for special INQUIRY items from the factory.

C: FIELDBUS PROTOCOLS & FORMATS

Communication protocols are simular to conversations, there are several different methods used.

ProfiBus, ModBus, InterBus-S and Ethernet use a method called "source-destination" communications: the message packets have destination information in them, and the fieldbus passes a token from node to node in a timed fashion.

DeviceNet, ControlNet, and CAN use a broadcast, producer-consumer model for communications: messages are broadcast to all nodes, and each node only "hears" messages intended for it.

Another major difference among fieldbuses is the format of the communications themselves. DeviceNet and CANopen messages are eight bytes long, while ProfiBus is "word-oriented", and can have an up to 256-byte "stack" per message.

ProfiBus and ControlNet are very fast networks – 12 megabits per second and 500 Mb/s, respectively. The trade-off is cost – DeviceNet is less expensive than the other two.

Fieldbuses also handle network traffic in different ways. DeviceNet uses "non-destructive bitwise arbitration." When two messages collide, the higher priority message goes first.

If the two are equal priority, there is a mechanism within DeviceNet (as well as CAN) that decides which one should go first.

By contrast, when a collision occurs in Ethernet, all devices "back off" and re-send their messages, which results in slower transmissions.

D. Specifications:

Interface Card type: Anybus-DT, Profibus-S or Controlnet-S or Mitsubishi Mini PLC
Up to 126 addresses
Data in 32 bit signed integer, 32 bit floating Point, 16 bit signed integer
Addresses stored in the 2500-1
8 programmable setpoints with minimum and maximum settings

E. Installation:

There are two (2) parts to this installation. The first (Section 2:) is for the Fairbanks Technician, and the second (Section 3:) is for the Engineer's Installation.

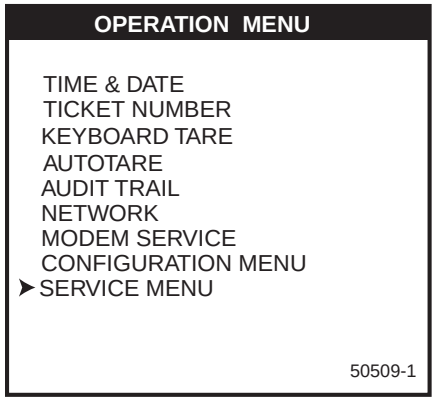
Section 2: Installation

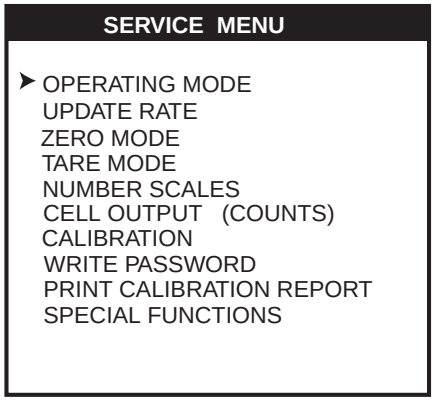
A. Hardware:
The Fieldbus card is installed in the 2500-F1/AF1/QF1 on stand-offs and permits the communications port to be accessed through the back plane of the instrument. The port connection type will be dependent upon fieldbus type and may be BNC, Terminal, or 9 Pin D Type. Cabling and connection will be the responsibility of the customer. See Appendix 1, 2, or 3 for connection information.

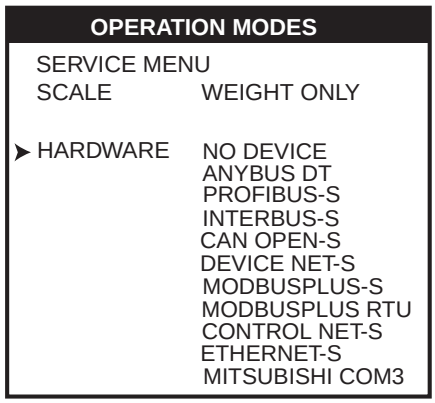
B. Software:
The Fieldbus application software resides in the standard 2500-F1/AF1/QF1 EPROM located on the controller PC. Must have Rev 7 or higher to be compatible.

C. Setup:
Weigh functions, configuration, calibration and most program entries are the same as for any 2500 Instrument. The Weigh screen will look the same as a standard 2500-F1/AF1/QF1 instrument.

Important Note: Before proceeding, the indicator must be installed, programmed, configured, tested, and calibrated per manual SJ4646 / 20525.



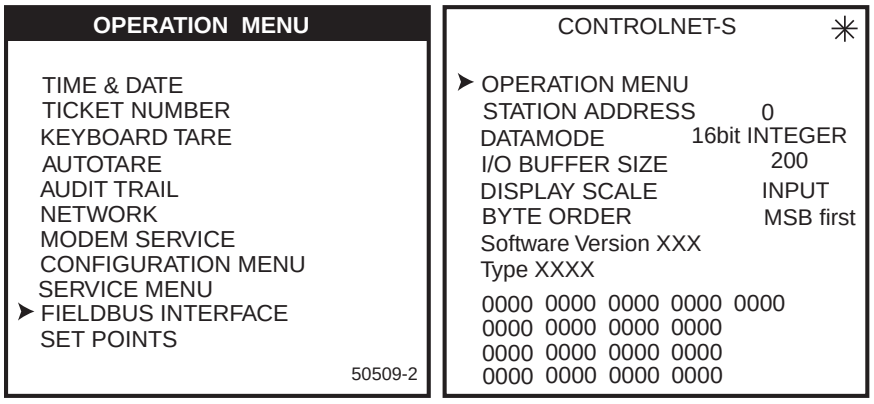




Go to the SERVICE MENU, OPERATING MODE. Select the HARDWARE NONE prompt and press the ENTER key to toggle through the available choices. The selection MUST MATCH the actual type of fieldbus card ordered and installed.

*** * WARNING! * ***

Damage and unsatisfactory performance can result if the fieldbus is enabled without being physically installed in the 2500 Instrument, especially if there is a MEM I/O board installed.



Go to the **OPERATION MENU**, place the cursor at **FIELDBUS INTERFACE** and press **ENTER**

Depending on the Hardware type selected, the screen will appear much like this:

D. Station address

The station address can be established with either the two PCB mounted rotary switches, or by leaving them set to zero and entering the station address in the FIELDBUS INTERFACE screen pictured above. The numeric range is from 1 to 126. Fairbanks recommends the switches be set to the zero position.

E. Data Mode (Formats)

Floating point numbers are stored using 4bytes (32bits), to IEEE-754 standard.
Range +/- 1.175494 e-38 to +/- 3.402823 e+38

32bit signed integers are stored using 4bytes (32bits)
Range -2147483648 to 2147483647

16bit signed integers are two 16bit words formed from a 32bit integer using the following method;

High 16bit word = 32bit integer/32768
Low 16bit word = 32bit integer module 32768

Examples: 109220 decimal = 0001 AAA4 32bit signed integer
109220 decimal = 0003 2AA4 2-16bit signed integers

-109220 decimal = FFFE 555C 32bit signed integer
-109220 decimal = FFFD D55C 2-16bit signed integers

109220 decimal = 47D5 5200 32bit float
-109220 decimal = C7D5 5200 32bit float

To convert 2 - 16bit integers to a 32bit integer; Multiply the high 16bit word by 32768 and add the low 16bit word.

F. I/O buffer size

The input / output buffer size will vary with the hardware configuration. The value entered defines the input and output buffer lengths in bytes. Thus a value of 200 assigns 200 bytes to the input buffer and 200 bytes to the output buffer.
Recommended initial starting value is 22 bytes.

G. Display

Data in the input, output, fieldbus specific and control registers can be viewed for diagnostics. Data for the PLC memory is limited to the scale inputs and outputs.
Choices are:
- Scale Input
- Scale Output
- Bus Control Registers
- Bus Specific Registers

Recommend setting to SCALE OUTPUT.

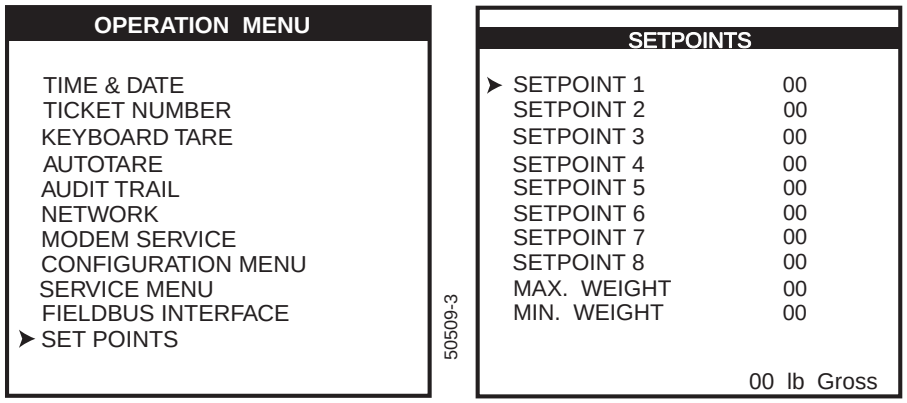
H. Byte Order

The byte order of the data registers can be changed from (LSB) least significant byte first to most significant byte first. 16 bit status words are not changed by this switch and are stored as (MSB) most significant byte first.

Choices are: **LSB** first or **MSB** first.

Recommend setting to MSB

I. Setpoints



Setpoint Data:

Setpoints can be read by the controlling PLC software to take specific action.
The eight (8) different settings can be divided amongst four (4) scales or all 8 can be used for 1 scale.

For Example: On a truck scale loading cement for a gross weight of 80,000 lbs. the setpoints may be set like this:

SETPOINT 1	**45000**	may be used this to check quantity in silo or other functions
SETPOINT 2	**60000**	may be used this to change silos or start machinery
SETPOINT 3	**75000**	may be used this to “slow” the fill rate or other functions
MAX. WEIGHT	**00**	used in PLC applications ONLY, set to 00
MIN. WEIGHT	**00**	used in PLC applications ONLY, set to 00

N*OTE:*
These settings DO NOT affect the instrument’s operation nor do they control hardware.

Section 3: Engineers Installation

he following information is the standard software as offered, as installed.
Modifications can be made with a Factory Inquiry.

1. Memory map below is per typical software Output view.
2. Memory map for the Input view in typical software is shifted down two data word lengths; i.e., Word 0 (zero) will be in Word 2 location.

All FieldBus Types Input / Output MEMORY MAP

Start Address	Hex	Decimal	
Scale 1	0	0	20 Words
Scale Message Line 1	28	40	26 bytes
Scale Message Line 2	42	66	26 bytes
Scale Message Line 3	5C	92	26 bytes
Scale 2	78	120	20 Words
Scale 3	A0	160	20 Words
Scale 4	C8	200	20 Words

Word	Byte	Register Usage
0	0 - 1	Status / Command Word 0 Scale 1
1	2 - 3	Status / Command Word 1
2	4 - 5	Status / Command Word 2
3-4	6 - 9	Unassigned
5 - 6	10 - 13	Gross Weight
7 - 8	14 - 17	Tare Weight
9 - 10	18 - 21	Net Weight
11 - 12	22 - 25	Setpoint 1
13 - 14	26 - 29	Setpoint 2
15 - 16	30 - 33	Flow Rate (weight / second)
17 - 19	34 - 39	Unassigned
	40 - 66	Display Message Line 1
	67 - 92	Display Message Line 2
	93 - 118	Display Message Line 3
60	120 - 121	Status / Command Word 0 Scale 2
61	122 - 123	Status / Command Word 1
62	124 - 125	Status / Command Word 2
63 - 64	126 - 129	Unassigned
65 - 66	130 - 133	Gross Weight
67 - 68	134 - 137	Tare Weight
69 - 70	138 - 131	Net Weight
71 - 72	142 - 135	Setpoint 3
73 - 74	146 - 139	Setpoint 4
75 - 76	150 - 153	Flow Rate (weight / second)
77 - 79	154 - 159	Unassigned

Word	Byte	Register Usage
80	160 - 161	Status / Command Word 0 Scale 3
81	162 - 163	Status / Command Word 1
82	164 - 165	Status / Command Word 2
83 - 84	166 - 169	Unassigned
85 - 86	170 - 173	Gross Weight
87 - 88	174 - 177	Tare Weight
89 - 90	178 - 171	Net Weight
91 - 92	182 - 175	Setpoint 5
93 - 94	186 - 179	Setpoint 6
94 - 95	188 - 191	Flow Rate (weight / second)
96 - 99	192 - 197	Unassigned
100	200 - 201	Status / Command Word 0 Scale 4
101	202 - 203	Status / Command Word 1
102	204 - 205	Status / Command Word 2
103 - 104	206 - 209	Unassigned
105 - 106	210 - 213	Gross Weight
107 - 108	214 - 217	Tare Weight
109 - 110	218 - 221	Net Weight
111 - 112	222 - 225	Setpoint 7
113 - 114	226 - 229	Setpoint 8
115 - 116	230 - 233	Flow Rate (weight / second)
117 - 119	234 - 239	Unassigned

Status / Command Word 0

bit	Usage	
0	Scale ID bits 0, 1, 2	
1	Scale 1 = 001, Scale 2 = 010, Scale 3 = 011, Scale 4 = 100	
2		
3	motion	
4	over capacity	gross weight = scale capacity
5	within 2% capacity	
6	Enable Tare	
7	Disable Tare	
8	lb units	
9	kg units	
10	ton units	
11	tonne units	
12		
13		
14		
15		

Status / Command Word 1

bit	Usage
0	Decimal Point Location bits 0, 1, 2
1	000 * 1.0; 001 * 0.1;010 * 0.01; 011 * 0.001; 100 * 0.0001
2	
3	Load Tare Command
4	Auto Tare Command
5	Load Setpoint 1 / 3 / 5 / 7
6	Load Setpoint 2 / 4 / 6 / 8
7	Zero Scale Command
8	Load Cell Status bits 8, 9, 10, 11, 12
9	All Good = 0
10	Defective Cell = Cell Number Binary
11	
12	
13	
14	Print Command
15	Beep

Status / Command Word 2

bit	Usage
0	Display Message Command / Operator Acknowledge
1	Scale weight at or above Maximum weight
2	Scale weight at or below Minimum weight
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Scale ID **Word 0 bits 0,1,2**

Command: Changes Instrument display to applicable scale.

Status: Value is the scale id if the scale is selected, from instrument keyboard or fieldbus, else the value is zero.

Motion **Word 0 bit 3**

Command: Not applicable.

Status: Indicates that the scale senses motion.

Over Capacity **Word 0 bit 4**

Command: Not applicable.

Status: Indicates that the scale is at 105% of capacity. If this condition is true the gross weight is sent to the fieldbus as the scale capacity.

Within 2% capacity **Word 0 bit 5**

Command: Not applicable.

Status: Scale is within a range of +/- 2% of capacity and zero.

Enable Tare **Word 0 bit 6**

Command: Enable keyboard tare or auto tare weight.

Status: Tare weight enabled.

Disable Tare **Word 0 bit 7**

Command: Disable keyboard tare and auto tare weight.

Status: Tare weight disabled.

lb Weight Units **Word 0 bit 8**

Command: Switch scale to lb units.

Status: Scale is indicating in lb units.

kg Weight Units **Word 0 bit 9**

Command: Switch scale to kg units.

Status: Scale is indicating in kg units.

ton Weight Units **Word 0 bit 10**

Command: Switch scale to ton units.

Status: Scale is indicating in ton units.

tonne Weight Units **Word 0 bit 11**

Command: Switch scale to tonne units.

Status: Scale is indicating in tonne units.

Decimal location **Word 1 bits 0,1,2**

Command: Used in integer to float weight conversions.

Status: Indicates location of decimal point in weight data.

Load tare **Word 1 bit 3**

Command: Load tare from tare memory address.

Status: Switches to 1 after command is executed and returns to 0 when command is cleared.

Auto tare **Word 1 bit 4**

Command: Take current scale gross weight as tare value.

Status: Switches to 1 after command is executed and returns to 0 when command is cleared.

Load Setpoint **Word 1 bit 5**

Command: Take setpoint data from setpoint memory location.
if scale 1 setpoint = setpoint 1
if scale 2 setpoint = setpoint 3
if scale 3 setpoint = setpoint 5
if scale 4 setpoint = setpoint 7

Status: Switches to 1 when command is executed returns to zero when command is cleared.

Load Setpoint **Word 1 bit 6**

Command: Take setpoint data from setpoint memory location.
if scale 1 setpoint = setpoint 2
if scale 2 setpoint = setpoint 4
if scale 3 setpoint = setpoint 6
if scale 4 setpoint = setpoint 8

Status: Switches to 1 when command is executed returns to zero when command is cleared.

Load Cell Status **Word 1 bits 8,9,10,11,12**

Command: Not applicable.

Status: All cells are when the value is zero, else data indicates the number of the failing or failed cell.

Print Command: **Word 1 bit 14**

Command: Print scale ticket

Status: Switches to 1 when the command is recognized and resets after the print cycle is complete and the command bit is reset.

Beep **Word 1 bit 15**

Command: Sound Instrument audible alarm.

Status: Switches to 1 when command is executed, resets to 0 after the command bit is reset.

Display Message **Word 2 bit 0**

Command: Display message on Instrument display. Message loaded from display memory 1 to 3 lines.

Status: Switches to 1 when the command is received and the message is displayed. When scale operator operates any key, the message and bit are cleared.

Scale above maximum weight **Word 2 bit 1**

Command: Not applicable.

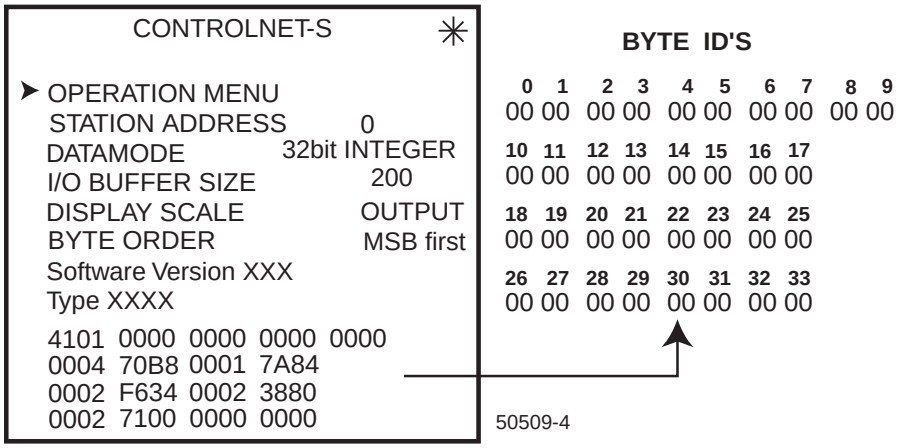
Status: Bit is set when scale weight is at or above the programmed value.

Scale below minimum weight **Word 2 bit 2**

Command: Not applicable.

Status: Bit is set when scale weight is at or below programmed value.

SECTION 4: FIELDBUS INTERFACE MENU



NOTE:
1. The values seen at the FIELDBUS INTERFACE MENU reflects the scale currently selected at the weight screen!

2. The values below are for scale 1 only. Scales 2 - 4 registers will show different values!

Bytes 0 - 5: Status / Command Words 0 - 2
Bytes 6 - 9: Unassigned
Bytes 10 - 13: Gross weight
Bytes 14 - 17: Tare weight
Bytes 18 - 21: Net weight
Bytes 22 - 25: Setpoint 1
Bytes 26 - 29: Setpoint 2
Bytes 30 - 33: Flow Rate

LINE BY LINE DESCRIPTION OF THE FIELDBUS INTERFACE MENU AS SEEN WHEN IN THE DISPLAY SCALE OUTPUT MODE.

NOTE:
1. In the examples below, items in BOLD and UNDERLINED are the item being defined.
2. Scale 1 setup as 400,000 lbs X 50 lbs

FIRST LINE BYTES "0" **I: 70 / 10-17**

61 (6 = SCALE AT ZERO and TARE ENABLED)
41 (4 = SCALE NOT AT ZERO and TARE ENABLED)
51 (5 = SCALE OVER CAPACITY and TARE ENABLED)
A1 (A = SCALE AT ZERO and TARE DISABLED)
81 (8 = SCALE NOT AT ZERO and TARE DISABLED)
91 (9 = SCALE OVER CAPACITY and TARE DISABLED)

4**1** (1 = SCALE ID "ID 1")
6**9** (9 = SCALE IN MOTION)

FIRST LINE BYTE "1" **I: 71 / 0-7**
01 (UNASSIGNED)
0**1** (1 = SCALE UNIT "UNITS LB)
0**2** (2 = SCALE UNIT "UNITS KG)
0**3** (3 = SCALE UNIT "UNITS TON)
0**4** (4 = SCALE UNIT "UNITS TONNE)

FIRST LINE BYTE "2" **I: 71 / 10-17**

0**1** (01 = DECIMAL POINT PLACEMENT "0.0")
0**2** (01 = DECIMAL POINT PLACEMENT "0.00")
0**3** (01 = DECIMAL POINT PLACEMENT "0.000")
0**4** (01 = DECIMAL POINT PLACEMENT "0.0000")
01 (LOAD TARE INPUT)
01 (AUTO TARE INPUT)
01 (LOAD SETPOINT INPUT)
01 (LOAD SETPOINT INPUT)
01 (ZERO SCALE INPUT)

FIRST LINE BYTE "3" **N13: 100 / 0-7**

00 (LOAD CELL STATUS)
00 (PRINT COMMAND)
00 (BEEP COMMAND)

FIRST LINE BYTE "4" **N13: 100 / 8-15**

04 (SCALE @ OR BELOW MIN WEIGHT SETTING)
00 (SCALE BETWEEN MIN AND MAX WEIGHT SETTINGS)
02 (SCALE @ OR ABOVE MAX WEIGHT SETTING)

FIRST LINE BYTE "5" **N13: 101 / 0-7**

00 (MOST SIGNIFICANT NIBBLE)
00 (LEAST SIGNIFICANT NIBBLE)

FIRST LINE BYTE "6 - 9"
0000 0000 (UNASSIGNED)

Byte 6	N13: 101 / 8-15	
Byte 7	N13: 102 / 0-7	
Byte 8	N13: 102 / 8-15	
Byte 9	N13: 103 / 0-7	
Byte 10	N13: 103 / 8-15	
Byte 11	N13: 104 / 0-7	MSD
Byte 12	N13: 104 / 8-15	INT
Byte 13	N13: 105 / 0-7	LSD

SECOND LINE "BYTES 10-13"
0004 70B8 (GROSS WT = 291000)

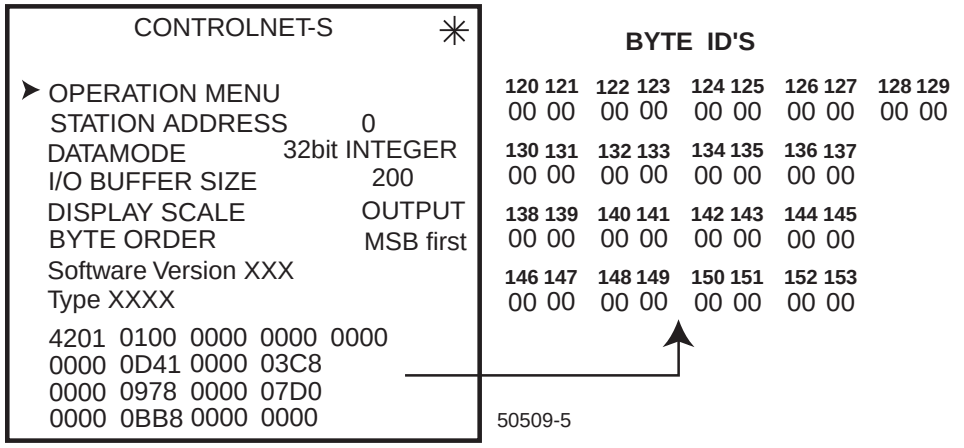
SECOND LINE "BYTES 14-17"
0001 7A84 (TARE WT = 96900)

THIRD LINE "BYTES 18-21"
0002 F634 (NET WT = 194100)

THIRD LINE "BYTES 22-25"
0001 3880 (SET POINT "1" VALUE = 80,000)

FOURTH LINE "BYTES 26-29"
0002 7100 (SET POINT "2" VALUE = 160,000)

FOURTH LINE "BYTES 30-33"
0000 0000 (FLOW RATE)



NOTE:
1. The values seen at the FIELDBUS INTERFACE MENU reflects the scale currently selected at the weight screen!

2. The values shown are for scale 2 only.

Bytes 120 - 125 Status / Command Words 0 - 2
Bytes 126 - 129 Unassigned
Bytes 130 - 133 Gross weight
Bytes 134 - 137 Tare weight
Bytes 138 - 141 Net weight
Bytes 142 - 145 Setpoint 1
Bytes 146 - 149 Setpoint 2
Bytes 150 - 153 Flow Rate

LINE BY LINE DESCRIPTION OF THE FIELDBUS INTERFACE MENU AS SEEN WHEN IN THE DISPLAY SCALE OUTPUT MODE.

NOTE:
1. In the examples below, items in BOLD and UNDERLINED are the item being defined.
2. Scale 2 setup as 5,000 lbs X 0.5 lbs

FIRST LINE BYTES "120"
62 (6 = SCALE AT ZERO and TARE ENABLED)
42 (4 = SCALE NOT AT ZERO and TARE ENABLED)
52 (5 = SCALE OVER CAPACITY and TARE ENABLED)

A2 (A = SCALE AT ZERO and TARE DISABLED)
82 (8 = SCALE NOT AT ZERO and TARE DISABLED)
92 (9 = SCALE OVER CAPACITY and TARE DISABLED)

0**2** (2 = SCALE ID "ID 2")
6**A** (A = SCALE IN MOTION)

FIRST LINE BYTE "121"
01 (UNASSIGNED)
0**1** (1 = SCALE UNIT "UNITS LB)
0**2** (2 = SCALE UNIT "UNITS KG)
0**3** (3 = SCALE UNIT "UNITS TON)
0**4** (4 = SCALE UNIT "UNITS TONNE)

FIRST LINE BYTE "122"
0**1** (01 = DECIMAL POINT PLACEMENT "0.0")
0**2** (01 = DECIMAL POINT PLACEMENT "0.00")
0**3** (01 = DECIMAL POINT PLACEMENT "0.000")
0**4** (01 = DECIMAL POINT PLACEMENT "0.0000")
01 (LOAD TARE INPUT)
01 (AUTO TARE INPUT)
01 (LOAD SETPOINT INPUT)
01 (LOAD SETPOINT INPUT)
01 (ZERO SCALE INPUT)

FIRST LINE BYTE "123"
00 (LOAD CELL STATUS)
00 (PRINT COMMAND)
00 (BEEP COMMAND)

FIRST LINE BYTE "124"
04 (SCALE @ OR BELOW MIN WEIGHT SETTING)
00 (SCALE BETWEEN MIN AND MAX WEIGHT SETTINGS)
02 (SCALE @ OR ABOVE MAX WEIGHT SETTING)

FIRST LINE BYTE "125"
00 (MOST SIGNIFICANT NIBBLE)
00 (LEAST SIGNIFICANT NIBBLE)

FIRST LINE BYTE "126 - 129"
0000 0000 (UNASSIGNED)

SECOND LINE "BYTES 130-133"
0000 0D41 (GROSS WT = 3393.0)

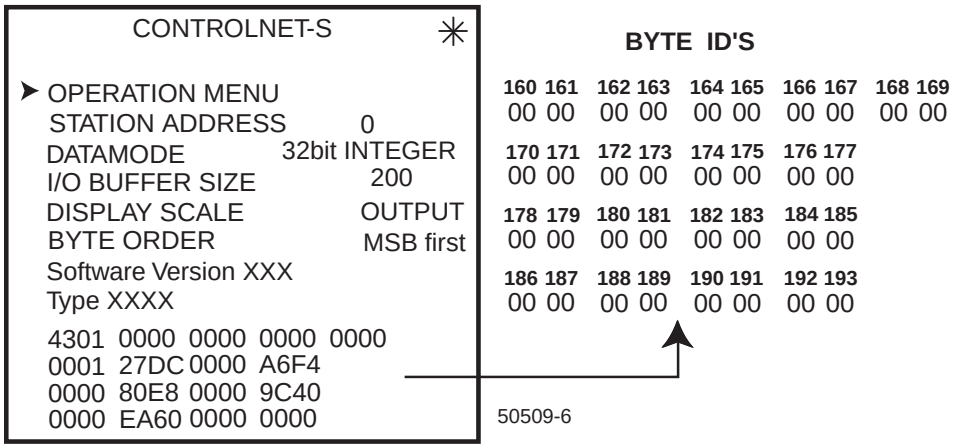
SECOND LINE "BYTES 134-137"
0000 03C8 (TARE WT = 968.5)

THIRD LINE "BYTES 138-141"
0000 0978 (NET WT = 2424.5)

THIRD LINE "BYTES 142-145"
0000 07D0 (SET POINT "3" VALUE = 2000.0)

FOURTH LINE "BYTES 146-149"
0000 0BB8 (SET POINT "4" VALUE = 3000.0)

FOURTH LINE "BYTES 150-153"
0000 0000 (FLOW RATE)



NOTE:
1. The values seen at the FIELDBUS INTERFACE MENU reflects the scale currently selected at the weight screen!

2. The values below are for scale 3 only.

Bytes 160 - 165 Status / Command Words 0 - 2
Bytes 166 - 169 Unassigned
Bytes 170 - 173 Gross weight
Bytes 174 - 177 Tare weight
Bytes 178 - 181 Net weight
Bytes 182 - 185 Setpoint 1
Bytes 186 - 189 Setpoint 2
Bytes 190 - 193 Flow Rate

LINE BY LINE DESCRIPTION OF THE FIELDBUS INTERFACE MENU AS SEEN WHEN IN THE DISPLAY SCALE OUTPUT MODE.

NOTE:
1. In the examples below, items in BOLD and UNDERLINED are the item being defined.
2. Scale 3 setup as 200,000 lbs X 20 lbs

FIRST LINE BYTES "160"
63 (6 = SCALE AT ZERO and TARE ENABLED)
43 (4 = SCALE NOT AT ZERO and TARE ENABLED)
53 (5 = SCALE OVER CAPACITY and TARE ENABLED)

A3 (A = SCALE AT ZERO and TARE DISABLED)
8**3** (8 = SCALE NOT AT ZERO and TARE DISABLED)
93 (9 = SCALE OVER CAPACITY and TARE DISABLED)

0**3** (3 = SCALE ID "ID 3")
6**B** (B = SCALE IN MOTION)

FIRST LINE BYTE "161"
01 (UNASSIGNED)
0**1** (1 = SCALE UNIT "UNITS LB)
0**2** (2 = SCALE UNIT "UNITS KG)
0**3** (3 = SCALE UNIT "UNITS TON)
0**4** (4 = SCALE UNIT "UNITS TONNE)

FIRST LINE BYTE "162"
0**1** (01 = DECIMAL POINT PLACEMENT "0.0")
0**2** (01 = DECIMAL POINT PLACEMENT "0.00")
0**3** (01 = DECIMAL POINT PLACEMENT "0.000")
0**4** (01 = DECIMAL POINT PLACEMENT "0.0000")
01 (LOAD TARE INPUT)
01 (AUTO TARE INPUT)
01 (LOAD SETPOINT INPUT)
01 (LOAD SETPOINT INPUT)
01 (ZERO SCALE INPUT)

FIRST LINE BYTE "163"
00 (LOAD CELL STATUS)
00 (PRINT COMMAND)
00 (BEEP COMMAND)

FIRST LINE BYTE "164"
04 (SCALE @ OR BELOW MIN WEIGHT SETTING)
00 (SCALE BETWEEN MIN AND MAX WEIGHT SETTINGS)
02 (SCALE @ OR ABOVE MAX WEIGHT SETTING)

FIRST LINE BYTE "165"
00 (MOST SIGNIFICANT NIBBLE)
00 (LEAST SIGNIFICANT NIBBLE)

FIRST LINE BYTE "166 - 169"
0000 0000 (UNASSIGNED)

SECOND LINE "BYTES 170-173"
0001 27DC (GROSS WT = 75740)

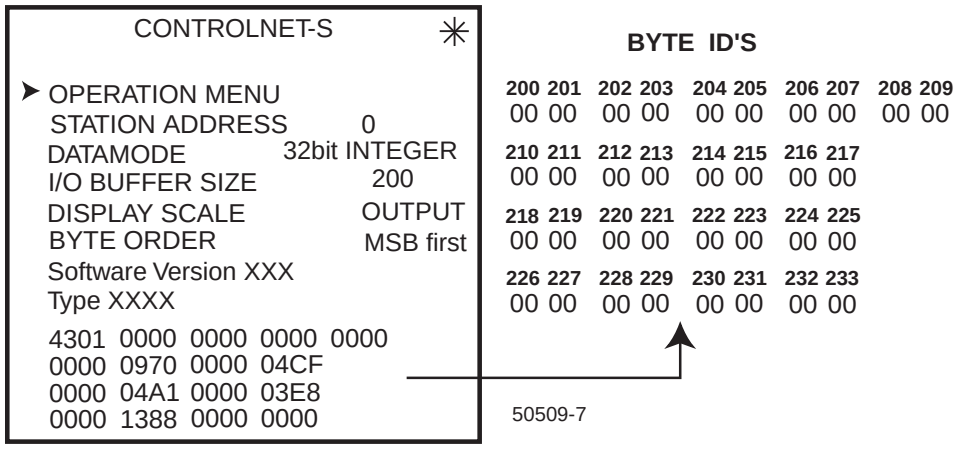
SECOND LINE "BYTES 174-177"
0000 A6F4 (TARE WT = 42740)

THIRD LINE "BYTES 178-181"
0000 80E8 (NET WT = 33000)

THIRD LINE "BYTES 182-185"
0000 9C40 (SET POINT "3" VALUE = 40000)

FOURTH LINE "BYTES 186-189"
0000 EA60 (SET POINT "4" VALUE = 60000)

FOURTH LINE "BYTES 190-193"
0000 0000 (FLOW RATE)



NOTE:
1. The values seen at the FIELDBUS INTERFACE MENU reflects the scale currently selected at the weight screen!

2. The values below are for scale 4 only.

Bytes 200 - 205 Status / Command Words 0 - 2
Bytes 206 - 209 Unassigned
Bytes 210 - 213 Gross weight
Bytes 214 - 217 Tare weight
Bytes 218 - 221 Net weight
Bytes 222 - 225 Setpoint 1
Bytes 226 - 229 Setpoint 2
Bytes 230 - 233 Flow Rate

LINE BY LINE DESCRIPTION OF THE FIELDBUS INTERFACE MENU AS SEEN WHEN IN THE DISPLAY SCALE OUTPUT MODE.

NOTE:
1. In the examples below, items in BOLD and UNDERLINED are the item being defined.
2. Scale 4 setup as 100 lbs X 0.01 lbs

FIRST LINE BYTES "200"
63 (6 = SCALE AT ZERO and TARE ENABLED)
43 (4 = SCALE NOT AT ZERO and TARE ENABLED)
53 (5 = SCALE OVER CAPACITY and TARE ENABLED)

A3 (A = SCALE AT ZERO and TARE DISABLED)
83 (8 = SCALE NOT AT ZERO and TARE DISABLED)
93 (9 = SCALE OVER CAPACITY and TARE DISABLED)
0**4** (4 = SCALE ID "ID 3")
6**C** (C = SCALE IN MOTION)

FIRST LINE BYTE "201"
01 (UNASSIGNED)
0**1** (1 = SCALE UNIT "UNITS LB)
0**2** (2 = SCALE UNIT "UNITS KG)
0**3** (3 = SCALE UNIT "UNITS TON)
0**4** (4 = SCALE UNIT "UNITS TONNE)

FIRST LINE BYTE "202"
0**1** (01 = DECIMAL POINT PLACEMENT "0.0")
0**2** (01 = DECIMAL POINT PLACEMENT "0.00")
0**3** (01 = DECIMAL POINT PLACEMENT "0.000")
0**4** (01 = DECIMAL POINT PLACEMENT "0.0000")
01 (LOAD TARE INPUT)
01 (AUTO TARE INPUT)
01 (LOAD SETPOINT INPUT)
01 (LOAD SETPOINT INPUT)
01 (ZERO SCALE INPUT)

FIRST LINE BYTE "203"
00 (LOAD CELL STATUS)
00 (PRINT COMMAND)
00 (BEEP COMMAND)

FIRST LINE BYTE "204"
04 (SCALE @ OR BELOW MIN WEIGHT SETTING)
00 (SCALE BETWEEN MIN AND MAX WEIGHT SETTINGS)
02 (SCALE @ OR ABOVE MAX WEIGHT SETTING)

FIRST LINE BYTE "205"
00 (MOST SIGNIFICANT NIBBLE)
00 (LEAST SIGNIFICANT NIBBLE)

FIRST LINE BYTE "206 - 209"
0000 0000 (UNASSIGNED)

SECOND LINE "BYTES 210-213"
0000 0970 (GROSS WT = 2416)

SECOND LINE "BYTES 214-217"
0000 04CF (TARE WT = 1231)

THIRD LINE "BYTES 218-221"
0000 04A1 (NET WT = 1185)

THIRD LINE "BYTES 222-225"
0000 03E8 (SET POINT "3" VALUE = 1000)

FOURTH LINE "BYTES 226-229"
0000 1388 (SET POINT "4" VALUE = 5000)

FOURTH LINE "BYTES 230-233"
0000 0000 (FLOW RATE)

SECTION 5: PARTS LIST

WARNING: For use with a 20394 Programmable Interface Assy ONLY!

Part Number 20394 PROFIBUS INTERFACE KIT

PART #	QTY	DESCRIPTION
18850	1	PCB Assy Fieldbus Interface
18272	1	PCB Assy Anybus Module Profibus
18320	4	Spacer Male / Female 6/32 x 1.00
18313	3	Spacer Hex 4-40 x .25
18316	1	Cable Assy 34 Pin
12342	2	Gasket
17534	2	Connector, liquid tight
11192	6	Washer, lock, ext tooth No. 4
18859	6	Screw, Mach, Ph, Phil 4-40 x .19
11191	4	Washer, lock, ext tooth No. 6
18272	1	Profibus, Anybus-S HI*See Eng
26447	1	Manuals CD, 2500 Instr. Operator

Part Number 20395 CONTROL NET INTERFACE KIT

PART #	QTY	DESCRIPTION
18850	1	PCB Assy Fieldbus Interface
18273	1	PCB Assy Anybus Module Control Net
18320	4	Spacer Male / Female 6/32 x 1.00
18313	3	Spacer Hex 4-40 x .25
18316	1	Cable Assy 34 Pin
12342	2	Gasket
17534	2	Connector, liquid tight
11192	6	Washer, lock, ext tooth No. 4
18859	6	Screw, Mach, Ph, Phil 4-40 x .19
11191	4	Washer, lock, ext tooth No. 6
50509	1	Manuals CD, 2500 Instr. Operator

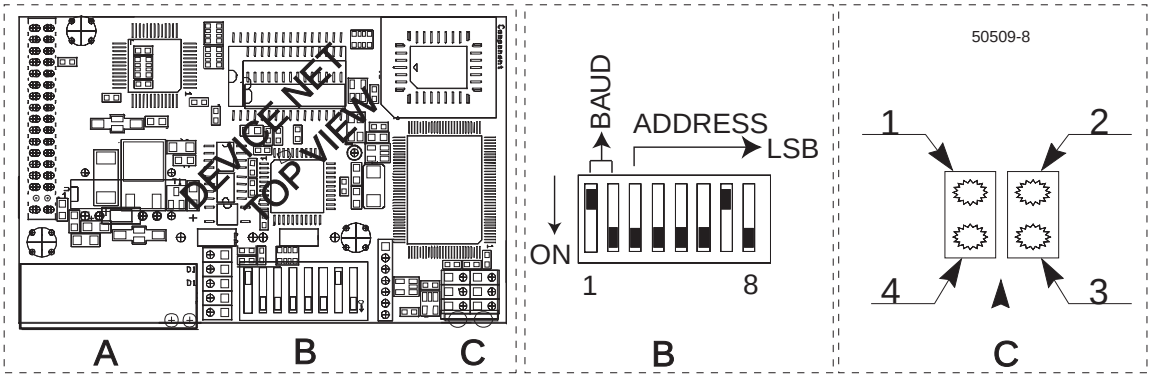
Part Number 20396 DEVICE NET INTERFACE KIT

PART #	QTY	DESCRIPTION
18271	1	PCB Assy Anybus Module Device Net
18320	4	Spacer Male / Female 6/32 x 1.00
18313	3	Spacer Hex 4-40 x .25
18316	1	Cable Assy 34 Pin
12342	2	Gasket
17534	2	Connector, liquid tight
11192	6	Washer, lock, ext tooth No. 4
18859	6	Screw, Mach, Ph, Phil 4-40 x .19
11191	4	Washer, lock, ext tooth No. 6
26447	1	Manual CD, 2500 Instr. Operator

Part Number 20397 MODBUS PLUS INTERFACE KIT

PART #	QTY	DESCRIPTION
18270	1	PCB Assy Anybus Module Modbus Plus
18320	4	Spacer Male / Female 6/32 x 1.00
18313	3	Spacer Hex 4-40 x .25
18316	1	Cable Assy 34 Pin
12342	2	Gasket
17534	2	Connector, liquid tight
11192	6	Washer, lock, ext tooth No. 4
18859	6	Screw, Mach, Ph, Phil 4-40 x .19
11191	4	Washer, lock, ext tooth No. 6
26447	1	Manual CD, 2500 Instr. Operator

APPENDIX 1: DEVICE NET



A: BUS CONNECTOR (either pluggable connector OR screw terminals)

1: V-
2: CAN_L
3: SHIELD
4: CAN_H
5: V+

B: DIPSWITCH SETTINGS

The DIPswitch serves two (2) purposes, setting the BAUD rate and the node address.

BAUDRATE: DIP SWITCH #1 & #2

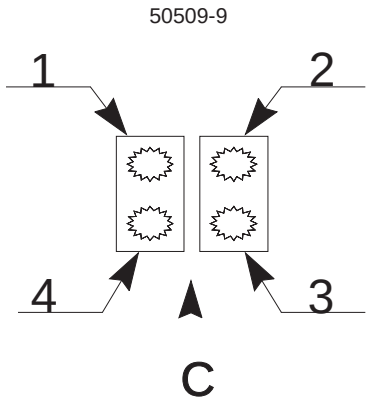
BAUDRATE (Bits Per Sec)	SET SWITCH 1-2
125K	00
250K	01
500K	10
RESERVED	11

ADDRESS	SET SWITCH 3-8
0	0 0 0 0 0 0
1	0 0 0 0 0 1
2	0 0 0 0 1 0
3	0 0 0 0 1 1
4	0 0 0 1 0 0

CONTINUE IN BINARY ORDER. RANGE IS “0-63”.

NOTES:

If baud rate and address are set by other means, the switch shall be set to “0xOFF”.
Depending on whether the dip switch is straight or right angled, the ON indication is different.



1: RESERVED

2: NETWORK STATUS

3: MODULE STATUS

4: RESERVED

Module errors are indicated with a NETWORK STATUS LED and a MODULE STATUS LED.

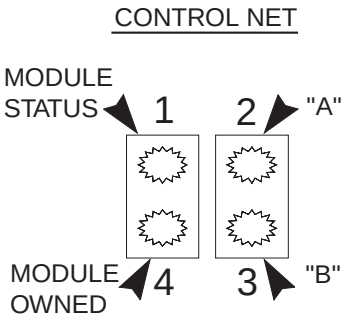
NETWORK STATUS LED

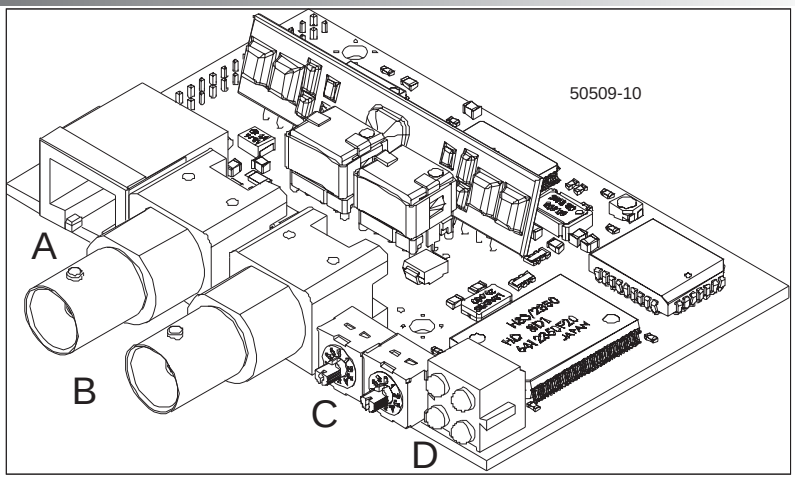
LED	INDICATION
Steady OFF	No Power / Not on LINE
Steady GREEN	Link OK / ON LINE / Connected
Steady RED	Critical Link Failure
Flashing GREEN	On LINE / Not Connected
Flashing RED	Connection Time Out

MODULE STATUS LED

LED	INDICATION
Steady OFF	No Power
Steady RED	Unrecoverable fault
Steady GREEN	Device Operational
Flashing GREEN	Module is initialized
Flashing RED	Minor Fault

APPENDIX 2: CONTROL NET





A: RJ-45 BUS Connection **B:** BNC Connectors

C: Rotary node address switches; Range “01” to “99”. If node address is set by other means, the switch shall be set to “0x OFF”.

D: Status LED’s CHANNELS A & B

LED	INDICATION
A & B Steady OFF	Module is not initialized
A & B Steady RED	Faulted unit, must be restarted or repaired
A & B Alternating RED / GREEN	Self - test of bus controller
A & B Flashing RED / OFF	Incorrect node configuration, duplicate address, etc
A OR B: Steady OFF	Channel is disabled
A OR B: Steady GREEN	Normal operation of channel
A OR B: Flashing GREEN / OFF	Temporary errors (node will self - correct) or node is not configured to go online
A OR B: Flashing RED / OFF	Media fault or no other nodes on the network
A OR B: Flashing RED / GREEN	Incorrect network configuration

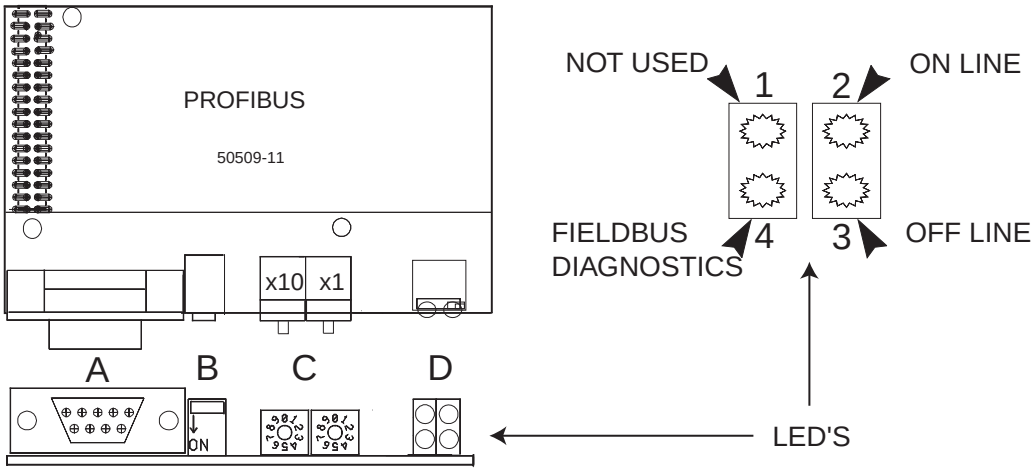
MODULE STATUS LED

LED Flashing GREEN	Module is waiting for initialization Module is initialized (**Ver. 1.5.x** *only*)
LED Steady GREEN	Module is initialized
LED Flashing RED	Minor fault, node ID was changed after initialization, etc
LED Steady RED	Major fault, module must be restarted

MODULE OWNED LED

LED Steady GREEN	A connection is opened against the Anybus-S module
LED OFF	No connection opened

APPENDIX 3: PROFIBUS



A: FIELDBUS CONNECTOR(S) (DB-9 or Screw Terminal)

DB-9	PIN	NAME	FUNCTION
	CASE	Shield	BUS Cable Shield
	1	Not Connected	-
	2	Not Connected	-
	3	B-LINE	+ RxD / TxD RS 485
	4	RTS	Request to Send
	5	GND BUS	Isolated RS 485 Ground
	6	+5V BUS	Isolated +5V RS 485
	7	Not Connected	-
	8	A-LINE	RxD / TxD RS 485
	9	Not Connected	-

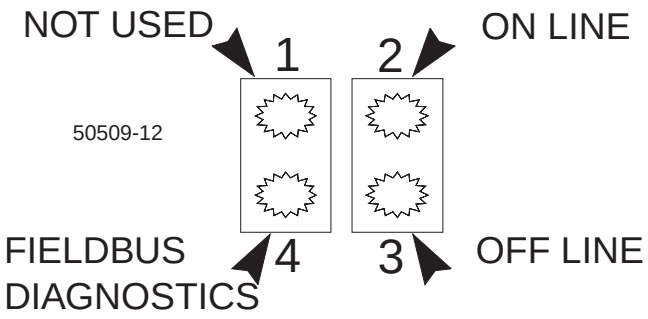
SCREW TERMINAL

1	+5V BUS	Isolated +5V RS 485
2	GND BUS	Isolated RS 485 Ground
3	A-LINE	-RxD / TxD RS 485
4	B-LINE	+RxD / TxD RS 485
5	Shield	BUS Cable Shield
6	RTS	Request to Send

B: BUS TERMINATOR: - If BUS node is the FIRST or LAST one, this is set to ON.

C: ROTARY NODE ADDRESS SWITCHES:

Range is “01” to “99”. If node address is set by other means, the switch shall be set to “0xOFF” and the range is extended to “1” to “126” .



D: STATUS LEDs

NAME	COLOR	FUNCTION
FIELD BUS DIAGNOSTICS	**RED**	Indicates certain faults on the Fieldbus side **FLASHING RED 1 Hz:** - Error in configuration: IN and/or OUT length set during initialization of the module is not equal to the length set during the configuration of the network **FLASHING RED 2 Hz:** - Error in user parameter data: - The length/contents of the user parameter data set during initialization of the module is not equal to the length/contents set during the configuration of the network. **FLASHING RED 4 Hz:** - Error in the initialization of the Profibus communication ASIC **OFF:** - No diagnostics present
ON - LINE	**GREEN**	Indicates the module is On-Line with the Fieldbus **GREEN** - Module is On-Line and data exchange is possible **OFF** - Module is OFF-LINE
OFF - LINE	**RED**	Indicates the module is OFF-LINE with the Fieldbus **RED** - Module is OFF-LINE and no data exchange is possible **OFF** - Module is not Off-Line

Appendix 4: AB RIO RS Works Example

The following information is the standard software as offered, as installed.
Modifications can be made with a Factory Inquiry.

1. Memory map below is per RSWorks Output view.
2. Memory map for the Input view in RSWorks is shifted down two data word lengths; i.e., Word 0 (zero) will be in Word 2 location.

FieldBus Input / Output MEMORY MAP

Start Address	Hex	Decimal	
Scale 1	0	0	20 Words
Scale Message Line 1	28	40	26 bytes
Scale Message Line 2	42	66	26 bytes
Scale Message Line 3	5C	92	26 bytes
Scale 2	78	120	20 Words
Scale 3	A0	160	20 Words
Scale 4	C8	200	20 Words

Word	Module Address	Byte	Module Address	Register Usage
0	I:70 / 10-17	0 - 1	I:71/0-7	Status / Command Word 0 Scale 1
1	I:71 / 10-17	2 - 3	N13: 100/07	Status / Command Word 1
2	N13: 100 / 8-15	4 - 5	N13: 101/07	Status / Command Word 2
3-4	N13:101 / 8-15	6 - 9	N13: 102/07	Unassigned
5 - 6	N13:102 / 8-15	10 - 13	N13: 103/07	Gross Weight
7 - 8		14 - 17		Tare Weight
9 - 10		18 - 21		Net Weight
11 - 12		22 - 25		Setpoint 1
13 - 14		26 - 29		Setpoint 2
15 - 16		30 - 33		Flow Rate (weight / second)
17 - 19		34 - 39		Unassigned
		40 - 66		Display Message Line 1
		67 - 92		Display Message Line 2
		93 - 118		Display Message Line 3
60		120 - 121		Status / Command Word 0 Scale 2
61		122 - 123		Status / Command Word 1
62		124 - 125		Status / Command Word 2
63 - 64		126 - 129		Unassigned
65 - 66		130 - 133		Gross Weight
67 - 68		134 - 137		Tare Weight
69 - 70		138 - 131		Net Weight
71 - 72		142 - 135		Setpoint 3
73 - 74		146 - 139		Setpoint 4
75 - 76		150 - 153		Flow Rate (weight / second)
77 - 79		154 - 159		Unassigned

Word	Module Address	Byte	Module Address	Register Usage
80		160 - 161		Status / Command Word 0 Scale 3
81		162 - 163		Status / Command Word 1
82		164 - 165		Status / Command Word 2
83 - 84		166 - 169		Unassigned
85 - 86		170 - 173		Gross Weight
87 - 88		174 - 177		Tare Weight
89 - 90		178 - 171		Net Weight
91 - 92		182 - 175		Setpoint 5
93 - 94		186 - 179		Setpoint 6
94 - 95		188 - 191		Flow Rate (weight / second)
96 - 99		192 - 197		Unassigned
100		200 - 201		Status / Command Word 0 Scale 4
101		202 - 203		Status / Command Word 1
102		204 - 205		Status / Command Word 2
103 - 104		206 - 209		Unassigned
105 - 106		210 - 213		Gross Weight
107 - 108		214 - 217		Tare Weight
109 - 110		218 - 221		Net Weight
111 - 112		222 - 225		Setpoint 7
113 - 114		226 - 229		Setpoint 8
115 - 116		230 - 233		Flow Rate (weight / second)
117 - 119		234 - 239		Unassigned

Status / Command Word 0

	Bit	Usage	
I:70 /	0	Scale ID bits 0, 1, 2	
Byte 0	1	Scale 1 = 001, Scale 2 = 010, Scale 3 = 011, Scale 4 = 100	
	2		
	3	motion	
	4	over capacity	gross weight = scale capacity
	5	within 2% capacity	
	6	Enable Tare	
	7	Disable Tare	
	8	lb units	
I:71 /	9	kg units	
Byte 1	10	ton units	
	11	tonne units	
	12		
	13		
	14		
	15		

Status / Command Word 1

	Bit	Usage
I:71 /	10	Decimal Point Location bits 0, 1, 2
Byte 2	11	000 * 1.0; 001 * 0.1;010 * 0.01; 011 * 0.001; 100 * 0.0001
	12	
	13	Load Tare Command
	14	Auto Tare Command
	15	Load Setpoint 1 / 3 / 5 / 7
	16	Load Setpoint 2 / 4 / 6 / 8
	17	Zero Scale Command
	0	Load Cell Status bits 8, 9, 10, 11, 12
N13:100 /	1	All Good = 0
Byte 3	2	Defective Cell = Cell Number Binary
	3	
	4	
	5	
	6	Print Command
	7	Beep

Status / Command Word 2

	Bit	Usage	
N13: / 100	8	Display Message Command / Operator Acknowledge	
Byte 4	9	Scale weight at or above Maximum weight	
	10	Scale weight at or below Minimum weight	
	11		
	12		
	13		
	14		
	15		
	0	**Byte 6**	N13: 101 / 8-15
N13: 101	1	**Byte 7**	N13: 102 / 0-7
Byte 5	2	**Byte 8**	N13: 102 / 8-15
	3	**Byte 9**	N13: 103 / 0-7
	4	**Byte 10**	N13: 103 / 8-15
	5	**Byte 11**	N13: 104 / 0-7
	6	**Byte 12**	N13: 104 / 8-15
	7	**Byte 13**	N13: 105 / 0-7
		Byte 14	N13: 105 / 8-15

Scale ID **Word 0 bits 0,1,2**

Command: Changes Instrument display to applicable scale.

Status: Value is the scale id if the scale is selected, from instrument keyboard or fieldbus, else the value is zero.

Motion **Word 0 bit 3**

Command: Not applicable.

Status: Indicates that the scale senses motion.

Over Capacity **Word 0 bit 4**

Command: Not applicable.

Status: Indicates that the scale is at 105% of capacity. If this condition is true the gross weight is sent to the fieldbus as the scale capacity.

Within 2% capacity **Word 0 bit 5**

Command: Not applicable.

Status: Scale is within a range of +/- 2% of capacity and zero.

Enable Tare **Word 0 bit 6**

Command: Enable keyboard tare or auto tare weight.

Status: Tare weight enabled.

Disable Tare **Word 0 bit 7**

Command: Disable keyboard tare and auto tare weight.

Status: Tare weight disabled.

lb Weight Units **Word 0 bit 8**

Command: Switch scale to lb units.

Status: Scale is indicating in lb units.

kg Weight Units **Word 0 bit 9**

Command: Switch scale to kg units.

Status: Scale is indicating in kg units.

ton Weight Units **Word 0 bit 10**

Command: Switch scale to ton units.

Status: Scale is indicating in ton units.

tonne Weight Units **Word 0 bit 11**

Command: Switch scale to tonne units.

Status: Scale is indicating in tonne units.

Decimal location **Word 1 bits 0,1,2**

Command: Used in integer to float weight conversions.

Status: Indicates location of decimal point in weight data.

Load tare **Word 1 bit 3**

Command: Load tare from tare memory address.

Status: Switches to 1 after command is executed and returns to 0 when command is cleared.

Auto tare **Word 1 bit 4**

Command: Take current scale gross weight as tare value.

Status: Switches to 1 after command is executed and returns to 0 when command is cleared.

Load Setpoint **Word 1 bit 5**

Command: Take setpoint data from setpoint memory location.
if scale 1 setpoint = setpoint 1
if scale 2 setpoint = setpoint 3
if scale 3 setpoint = setpoint 5
if scale 4 setpoint = setpoint 7

Status: Switches to 1 when command is executed returns to zero when command is cleared.

Load Setpoint **Word 1 bit 6**

Command: Take setpoint data from setpoint memory location.
if scale 1 setpoint = setpoint 2
if scale 2 setpoint = setpoint 4
if scale 3 setpoint = setpoint 6
if scale 4 setpoint = setpoint 8

Status: Switches to 1 when command is executed returns to zero when command is cleared.

Load Cell Status **Word 1 bits 8,9,10,11,12**

Command: Not applicable.

Status: All cells are when the value is zero, else data indicates the number of the failing or failed cell.

Print Command: **Word 1 bit 14**

Command: Print scale ticket

Status: Switches to 1 when the command is recognized and resets after the print cycle is complete and the command bit is reset.

Beep **Word 1 bit 15**

Command: Sound Instrument audible alarm.

Status: Switches to 1 when command is executed, resets to 0 after the command bit is reset.

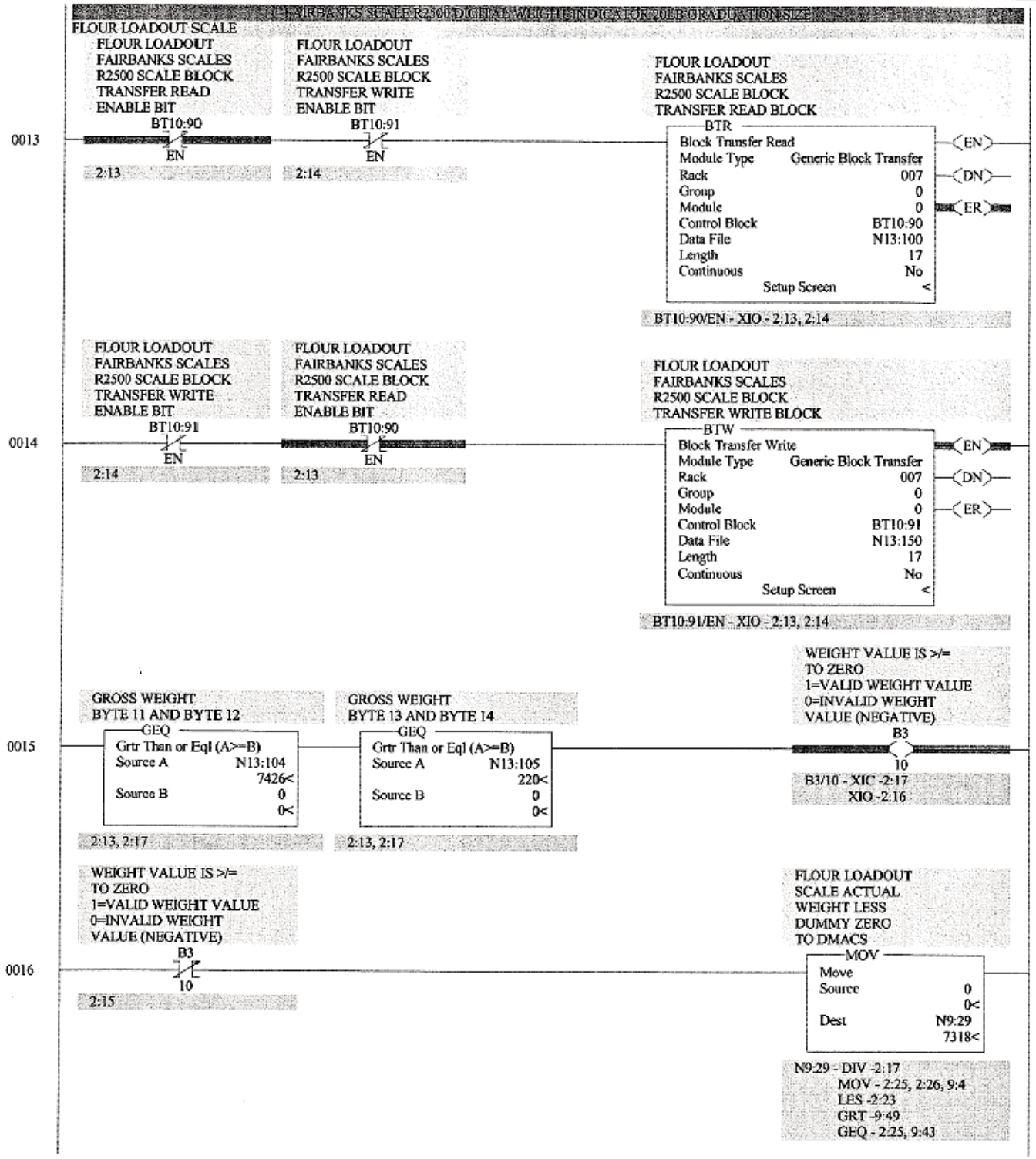
Display Message **Word 2 bit 0**

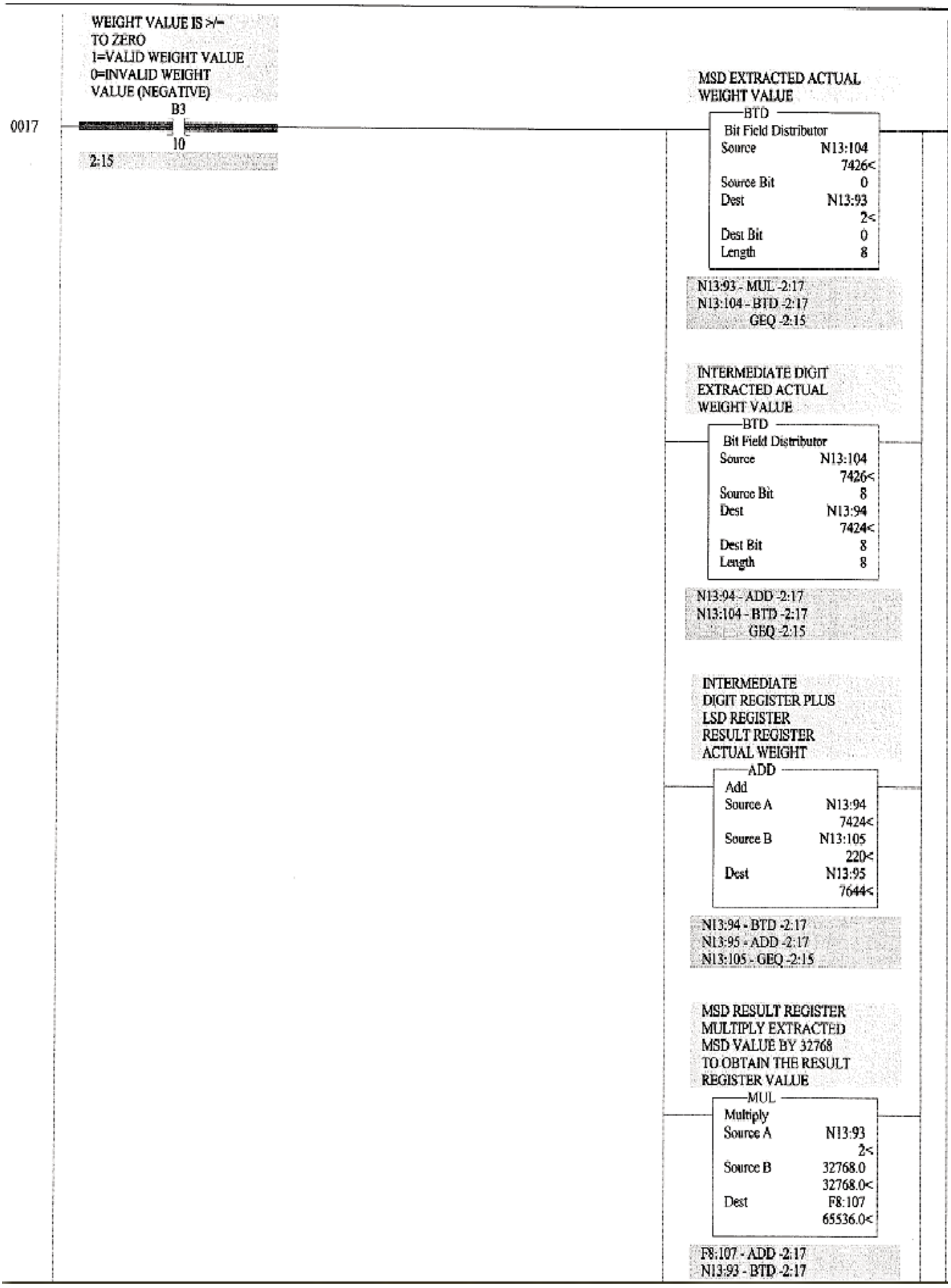
Command: Display message on Instrument display. Message loaded from display memory 1 to 3 lines.

Status: Switches to 1 when the command is received and the message is displayed. When scale operator operates any key, the message and bit are cleared.

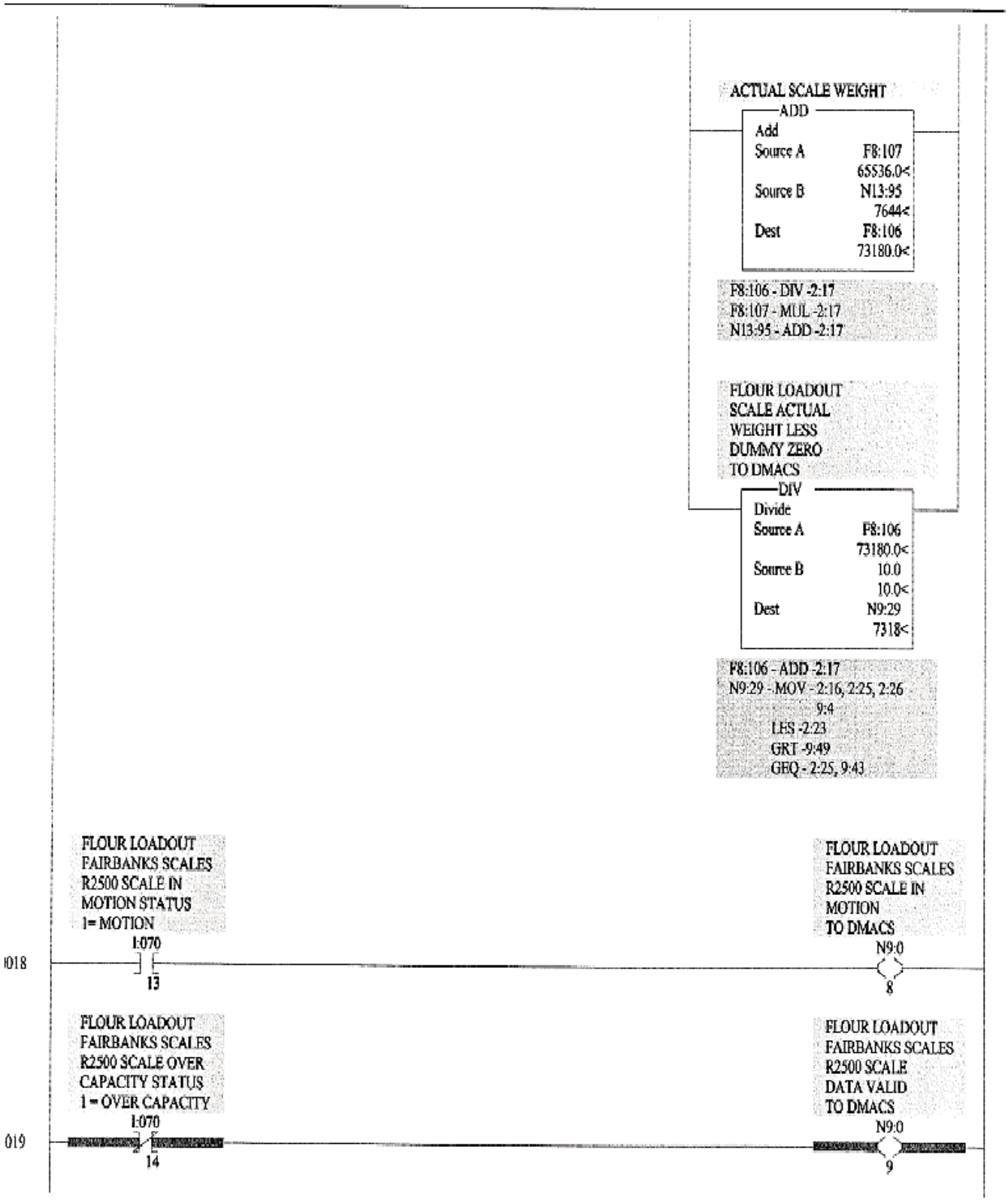
Scale above maximum weight **Word 2 bit 1**
Command: Not applicable.
Status: Bit is set when scale weight is at or above the programmed value.

Scale below minimum weight **Word 2 bit 2**
Command: Not applicable.
Status: Bit is set when scale weight is at or below programmed value.

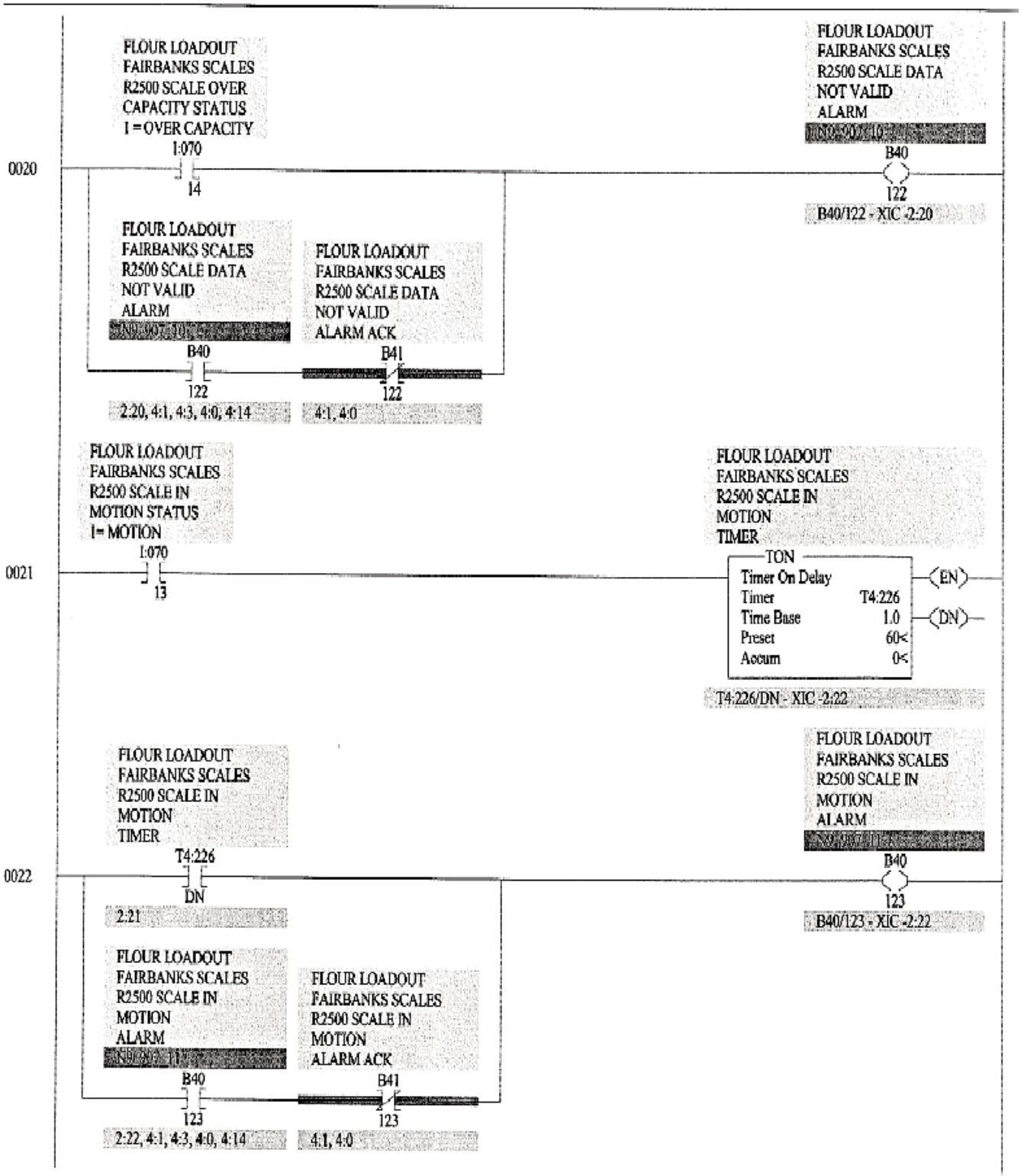

FAIRBANKS SCALE R2500 DIGITAL WEIGHT INDICATOR 20LB GRADUATION SIZE
FLOUR LOADOUT SCALE
0013
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER READ ENABLE BIT
BT10:90
EN
2:13
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER WRITE ENABLE BIT
BT10:91
EN
2:14
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER READ BLOCK
BTR
Block Transfer Read
Module Type Generic Block Transfer
Rack 007
Group 0
Module 0
Control Block BT10:90
Data File N13:100
Length 17
Continuous No
Setup Screen
EN
DN
ER
BT10:90/EN - XIO - 2:13, 2:14
0014
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER WRITE ENABLE BIT
BT10:91
EN
2:14
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER READ ENABLE BIT
BT10:90
EN
2:13
FLOUR LOADOUT FAIRBANKS SCALES R2500 SCALE BLOCK TRANSFER WRITE BLOCK
BTW
Block Transfer Write
Module Type Generic Block Transfer
Rack 007
Group 0
Module 0
Control Block BT10:91
Data File N13:150
Length 17
Continuous No
Setup Screen
EN
DN
ER
BT10:91/EN - XIO - 2:13, 2:14
0015
GROSS WEIGHT BYTE 11 AND BYTE 12
GEQ
Grtr Than or Eql (A>=B)
Source A N13:104
7426<
Source B 0
0<
2:13, 2:17
GROSS WEIGHT BYTE 13 AND BYTE 14
GEQ
Grtr Than or Eql (A>=B)
Source A N13:105
220<
Source B 0
0<
2:13, 2:17
WEIGHT VALUE IS >/= TO ZERO 1=VALID WEIGHT VALUE 0=INVALID WEIGHT VALUE (NEGATIVE)
B3
10
B3/10 - XIC -2:17
XIO -2:16
0016
WEIGHT VALUE IS >/= TO ZERO 1=VALID WEIGHT VALUE 0=INVALID WEIGHT VALUE (NEGATIVE)
B3
10
2:15
FLOUR LOADOUT SCALE ACTUAL WEIGHT LESS DUMMY ZERO TO DMACS
MOV
Move
Source 0
0<
Dest N9:29
7318<
N9:29 - DIV -2:17
MOV - 2:25, 2:26, 9:4
LES -2:23
GRT -9:49
GEQ - 2:25, 9:43


WEIGHT VALUE IS >/=
TO ZERO
1=VALID WEIGHT VALUE
0=INVALID WEIGHT
VALUE (NEGATIVE)
B3
10
2:15
0017
MSD EXTRACTED ACTUAL
WEIGHT VALUE
BTD
Bit Field Distributor
Source N13:104
7426<
Source Bit 0
Dest N13:93
2<
Dest Bit 0
Length 8
N13:93 - MUL -2:17
N13:104 - BTD -2:17
GEQ -2:15
INTERMEDIATE DIGIT
EXTRACTED ACTUAL
WEIGHT VALUE
BTD
Bit Field Distributor
Source N13:104
7426<
Source Bit 8
Dest N13:94
7424<
Dest Bit 8
Length 8
N13:94 - ADD -2:17
N13:104 - BTD -2:17
GEQ -2:15
INTERMEDIATE
DIGIT REGISTER PLUS
LSD REGISTER
RESULT REGISTER
ACTUAL WEIGHT
ADD
Add
Source A N13:94
7424<
Source B N13:105
220<
Dest N13:95
7644<
N13:94 - BTD -2:17
N13:95 - ADD -2:17
N13:105 - GEQ -2:15
MSD RESULT REGISTER
MULTIPLY EXTRACTED
MSD VALUE BY 32768
TO OBTAIN THE RESULT
REGISTER VALUE
MUL
Multiply
Source A N13:93
2<
Source B 32768.0
32768.0<
Dest F8:107
65536.0<
F8:107 - ADD -2:17
N13:93 - BTD -2:17

LAD 2 - TOPOFTREE - BLOCK TRANSFERS, DATA HIGHWAY #NAME? & SCALES --- Total Rungs in File = 136



LAD 2 - TOPOFTREE - BLOCK TRANSFERS, DATA HIGHWAY #NAME? & SCALES --- Total Rungs in File = 136



File N13 (bin) -- INTEGER -- INGREDIENT FEEDER CALCULATION DATA

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(Symbol) Description
N13:88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	MSD EXTRACTED ACTUAL WEIGHT VALUE
N13:94	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	INTERMEDIATE DIGIT EXTRACTED ACTUAL WEIGHT VALUE
N13:95	0	0	0	1	1	1	0	1	1	1	0	1	1	1	0	0	INTERMEDIATE DIGIT REGISTER PLUS LSD REGISTER RESULT REGISTER ACTUAL WEIGHT
N13:96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:100	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	STATUS WORD 1 UPPER BYTE (BYTE 3) AND STATUS WORD 2 LOWER BYTE (BYTE 4)
N13:101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:104	0	0	0	1	1	1	0	1	0	0	0	0	0	0	1	0	GROSS WEIGHT BYTE 11 AND BYTE 12
N13:105	0	0	0	0	0	0	0	0	1	1	0	1	1	1	0	0	GROSS WEIGHT BYTE 13 AND BYTE 14
N13:106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N13:107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

N13:0/0

Radix: Binary

Symbol:

Columns:

Desc:

N13

Properties Usage Help

File N13 (dec) — INTEGER — INGREDIENT FEEDER CALCULATION DATA

Offset	0	1	2	3	4	5	6	7	8	9
N13:0	0	2657	3409	3531	2987	3369	1329	682	0	0
N13:10	0	1669	2253	2388	2149	2279	186	-533	0	0
N13:20	0	50	79	50	50	419	50	50	0	0
N13:30	0	50	50	50	50	150	50	50	0	0
N13:40	0	0	0	0	0	0	0	0	0	0
N13:50	0	0	0	0	0	0	0	0	0	0
N13:60	0	0	0	0	0	0	0	0	0	0
N13:70	0	0	0	0	0	0	0	0	0	0
N13:80	0	0	0	0	0	0	0	0	0	0
N13:90	0	0	0	2	7424	7644	0	0	0	0
N13:100	512	0	0	0	7426	220	0	0	7426	220
N13:110	0	0	0	0	0	40	0	0	0	0
N13:120	0	0	0	0	0	0	0	0	0	0
N13:130	0	0	0	0	0	0	0	0	0	0
N13:140	0	0	0	0	0	0	0	0	0	0
N13:150	0	0	0	0	0	0	0	0	0	0
N13:160	0	0	0	0	0	0	0	0	0	0
N13:170	0	0	0	0	0	0	0	0	0	0
N13:180	0	0	0	0	0	0	0	0	0	0
N13:190	16641	18689	24833	26881	0	0	0	0	0	0

N13:20

N13:0 Radix: Decimal

Symbol: Columns:

Desc:

N13 Properties Usage Help