PROFINET®

Interface for 920i® Indicator

Installation Manual
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1.0 Introduction

This manual provides information to install and use the Rice Lake Weighing Systems PROFINET® Interface. The PROFINET Interface allows the 920® indicator to communicate with a PROFINET network.

See the 920i Installation Manual (PN 67887) for additional installation information and detailed descriptions of indicator functions.

The PROFINET Interface is installed inside the indicator enclosure. Installation in NEMA Type 4X stainless steel enclosures allows use in washdown environments provided proper cord grips are tightened and screws are torqued correctly.

**WARNING** Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

The PROFINET card should NOT be used to communicate between buildings. The Ethernet port is not suitable for connection to circuits used outside the building and is subject to lightning or power faults.

Manuals can be viewed or downloaded from the Rice Lake Weighing Systems website at [www.ricelake.com/manuals](http://www.ricelake.com/manuals)

1.1 Overview

PROFINET is an open industrial networking standard allowing control applications to make use of widely-available PROFINET communications components and physical media. PROFINET is based on the IEEE 802.3 Ethernet standard, the TCP/IP protocol suite and CIP (Common Industrial Protocol), the real-time I/O and information protocol used by many industrial network protocols.

The primary controller communicates by sending commands through the PROFINET interface to the indicator. The indicator responds to the primary controller with data and status depending on the command sent. These actions are referred to as polled response.
2.0 Installation

The PROFINET Interface hardware consists of two stacked boards for the option card. PROFINET specific functions are provided by a PROFINET module, which is factory-installed onto a bus adapter card. The bus adapter card plugs into an open option card slot on the 920i CPU board or expansion board and provides power and access from the indicator bus to the PROFINET module.

2.1 Installing the PROFINET Interface

Use the following steps to install the PROFINET Interface into the 920i indicator.

1. Disconnect indicator from power source.

   **WARNING** The 920i have no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

2. Open the indicator enclosure. For indicator models with backplates, place the indicator face-down on an anti-static work mat.

3. Remove screws that hold the backplate to the enclosure body.

   **CAUTION** Use a wrist strap for grounding and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.

4. Align the large connector (J1) on the bus adapter card with connector J5 or J6 on the 920i CPU board or one of the connectors J1-J8 if installing on an Expansion board.

5. Press the card down gently to ensure it is properly seated on the connector.

6. Use the screws and lockwashers provided in the kit to secure the option card to the threaded standoffs that align with the card mounting holes.

7. Insert the network cable into an available cord grip.

8. Route the cable along the inside of enclosure to the RJ-45 connector on the PROFINET card.

9. Connect network cables to connector on the PROFINET module (Figure 2-3).

10. Use cable ties to secure loose cables inside the enclosure.

![Figure 2-1. PROFINET Option Card Installed on CPU Board](image-url)
11. Use the appropriate procedure below to close the unit. For universal and desktop models, place the backplate on the enclosure aligning the holes. Secure with the retained screws. Use the torque pattern shown in Figure 2-2 to prevent distorting the backplate gasket. Torque screws to 15 in-lb (1.7 N-m) for 920i desktop and universal models. Torque screws to 8 in-lb for the 920i wall mount model.

![Figure 2-2. 920i Enclosure Backplate](image)

*IMPORTANT* Torqued screws may become less tight as the gasket is compressed during torque pattern, therefore a second torque is required using the same pattern and torque value.

12. Ensure no excess cable is left inside the enclosure. The cord grips must be tightened to 33 in-lb around the cable.

13. Reconnect power to the indicator. The indicator automatically recognizes all installed option cards when the unit is powered on. No hardware-specific configuration is required to identify the installed PROFINET Interface to the system.

![Figure 2-3. Fieldbus Card and PROFINET Module](image)

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Application Connector</td>
<td>Consult the general Anybus-S Parallel Design Guide for further information</td>
</tr>
<tr>
<td>2</td>
<td>PROFINET Connector</td>
<td>The PROFINET interface supports 10/100Mbit, full or half duplex operation</td>
</tr>
<tr>
<td>3</td>
<td>Anybus Watchdog</td>
<td>Consult the general Anybus-S Parallel Design Guide for further information. See Table 2-5</td>
</tr>
<tr>
<td>4</td>
<td>Status Indicators</td>
<td>LEDs indicate run time status and errors to the user. See Section 2.2</td>
</tr>
</tbody>
</table>

*Table 2-1. PROFINET Card Indicators*
2.2 LED Status Indicators

An LED array on the PROFINET module provides status information for troubleshooting (Figure 2-4):

- LED 1 provides status about the link
- LED 2 provides communication status information
- LED 3 provides module status
- LED 4 is not used

LED 1: Link Status

<table>
<thead>
<tr>
<th>LED 1 Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Link established</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>Receiving/transmitting data</td>
</tr>
<tr>
<td></td>
<td>Off</td>
<td>No link or no power</td>
</tr>
</tbody>
</table>

*Table 2-2. LED 1 Status*

LED 2: Communication Status

<table>
<thead>
<tr>
<th>LED 2 Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>On</td>
<td>Link established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Connection with IO controller established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IO controller is in RUN state</td>
</tr>
<tr>
<td>1 Flash</td>
<td></td>
<td>Unit is online, STOP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Connection with IO controller established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IO controller is in STOP state</td>
</tr>
<tr>
<td>Off</td>
<td></td>
<td>Offline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No connection with IO controller</td>
</tr>
</tbody>
</table>

*Table 2-3. LED 2 Status*
**LED 3: Network Status.**

<table>
<thead>
<tr>
<th>LED 3 Color</th>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Steady green</td>
<td>Initializing, no error</td>
</tr>
<tr>
<td></td>
<td>Green, 1 flashing</td>
<td>Diagnostic data is available</td>
</tr>
<tr>
<td></td>
<td>Green, 2 flashes</td>
<td>Blink. is used as an engineering tool to identify the Anybus module</td>
</tr>
<tr>
<td>Red</td>
<td>1 flash</td>
<td>Configuration error -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Too many modules/sub-modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IO size derived from IO controller/configuration is too large</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Configuration mismatch (no module, wrong module)</td>
</tr>
<tr>
<td></td>
<td>3 flashes</td>
<td>No station named or no IP address assigned</td>
</tr>
<tr>
<td></td>
<td>4 flashes</td>
<td>Internal error</td>
</tr>
<tr>
<td>Not used</td>
<td>Off</td>
<td>- -</td>
</tr>
</tbody>
</table>

*Table 2-4. LED 3 Status*

**Watchdog LED**

A single bi-color LED on the surface of the PROFINET module provides diagnostic information for debugging the module itself. *Table 2-5* lists the indications provided by the debugging LED.

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No power</td>
</tr>
<tr>
<td>Red, 4Hz</td>
<td>DPRAM check fault</td>
</tr>
<tr>
<td>Red, 2Hz</td>
<td>ASIC and FLASH ROM check fault</td>
</tr>
<tr>
<td>Red, 1Hz</td>
<td>RAM check fault</td>
</tr>
<tr>
<td>Green, 2Hz</td>
<td>Module not initialized</td>
</tr>
<tr>
<td>Green, 1Hz</td>
<td>Module initialized and running</td>
</tr>
</tbody>
</table>

*Table 2-5. Debugging LED Indications*
3.0 Commands

Commands are used by the PROFINET primary device to send and receive data from the PROFINET Interface as integer or floating-point data. The primary sends eight bytes in the output format (used to write commands to the indicator) and reads eight bytes in the input format (used to read data from the indicator).

Decimal Point Handling

Integer commands return no decimal point information to the primary. For example, a value of 750.1 displayed on the indicator is returned to the primary as 7501. Floating point commands support decimal point information with no special handling.

3.1 Output Command Format

To perform a command, the primary uses the output command format to send four 16-bit words to the PROFINET Interface. These four words contain the command and any parameters necessary to execute it.

<table>
<thead>
<tr>
<th>Word</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word 1</td>
<td>Command number</td>
</tr>
<tr>
<td>Word 2</td>
<td>Parameter</td>
</tr>
<tr>
<td>Word 3</td>
<td>Value (MSW)</td>
</tr>
<tr>
<td>Word 4</td>
<td>Value (LSW)</td>
</tr>
</tbody>
</table>

Table 3-1. Output Command Format

The contents of each output command format word are described below:

3.1.1 Command number

The first word echoes the command number. If the command fails or is not recognized, the negative of the command number is returned to signal the error. See Section 3.1.2 for BYTE swapping parameters.

A lockout feature, incorporated into the indicator receive mechanism, looks for change in the output format data to prevent inundation by the same command. See affected commands noted in Table 1-1 with an (*). Repeated commands must be separated by any other valid command/parameter/value combination.

Parameter value

In communication with a multi-scale indicator, the scale number is sent in the second word of the output command format. Zero (0) represents the current scale. Certain commands require a parameter other than a scale number, such as a slot number, setpoint number, or other selection parameter. See the command descriptions for specific command requirements.

Value

The third and fourth words of the output format are used to pass value data on certain commands. Values entered in these words are treated as unsigned long integers or floating-point values, depending on the command.

Command number

The number representing the indicator command is sent in the first word. Table 3-2 lists the commands that can be specified for indicators. Some commands may not be available on all indicators.

<table>
<thead>
<tr>
<th>Decimal</th>
<th>Hex</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0x000</td>
<td>Return Status and Weight (integer)</td>
</tr>
<tr>
<td>1</td>
<td>0x001</td>
<td>Display Channel</td>
</tr>
<tr>
<td>2</td>
<td>0x002</td>
<td>Display Gross Weight</td>
</tr>
<tr>
<td>3</td>
<td>0x003</td>
<td>Display Net Weight</td>
</tr>
<tr>
<td>9</td>
<td>0x009</td>
<td>Gross/Net key press (toggle)</td>
</tr>
<tr>
<td>10</td>
<td>0x00A</td>
<td>Zero*</td>
</tr>
</tbody>
</table>

Table 3-2. Remote Commands
<table>
<thead>
<tr>
<th>Decimal</th>
<th>Hex</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>0x00B</td>
<td>Display Tare*</td>
</tr>
<tr>
<td>12</td>
<td>0x00C</td>
<td>Enter Tare*</td>
</tr>
<tr>
<td>13</td>
<td>0x00D</td>
<td>Acquire Tare*</td>
</tr>
<tr>
<td>14</td>
<td>0x00E</td>
<td>Clear Tare*</td>
</tr>
<tr>
<td>16</td>
<td>0x010</td>
<td>Primary Units</td>
</tr>
<tr>
<td>17</td>
<td>0x011</td>
<td>Secondary Units</td>
</tr>
<tr>
<td>18</td>
<td>0x012</td>
<td>Tertiary Units</td>
</tr>
<tr>
<td>19</td>
<td>0x013</td>
<td>Units key press (toggle units)</td>
</tr>
<tr>
<td>20</td>
<td>0x014</td>
<td>Print Request</td>
</tr>
<tr>
<td>21</td>
<td>0x015</td>
<td>Display Accumulator</td>
</tr>
<tr>
<td>22</td>
<td>0x016</td>
<td>Clear Accumulator</td>
</tr>
<tr>
<td>23</td>
<td>0x017</td>
<td>Push Weight to Accumulator</td>
</tr>
<tr>
<td>32</td>
<td>0x020</td>
<td>Return Gross (integer)</td>
</tr>
<tr>
<td>33</td>
<td>0x021</td>
<td>Return Net (integer)</td>
</tr>
<tr>
<td>34</td>
<td>0x022</td>
<td>Return Tare (integer)</td>
</tr>
<tr>
<td>37</td>
<td>0x025</td>
<td>Return Current Display (integer)</td>
</tr>
<tr>
<td>38</td>
<td>0x026</td>
<td>Return Accumulator (integer)</td>
</tr>
<tr>
<td>39</td>
<td>0x027</td>
<td>Return Rate of Change (integer) 1280 only</td>
</tr>
<tr>
<td>95</td>
<td>0x05F</td>
<td>Set Batching State</td>
</tr>
<tr>
<td>96</td>
<td>0x060</td>
<td>Batch Start</td>
</tr>
<tr>
<td>97</td>
<td>0x061</td>
<td>Batch Pause</td>
</tr>
<tr>
<td>98</td>
<td>0x062</td>
<td>Batch Reset</td>
</tr>
<tr>
<td>99</td>
<td>0x063</td>
<td>Batch Status</td>
</tr>
<tr>
<td>112</td>
<td>0x070</td>
<td>Lock Indicator Front Panel</td>
</tr>
<tr>
<td>113</td>
<td>0x071</td>
<td>Unlock Indicator Front Panel</td>
</tr>
<tr>
<td>114</td>
<td>0x072</td>
<td>Set Digital Output ON</td>
</tr>
<tr>
<td>115</td>
<td>0x073</td>
<td>Set Digital Output OFF</td>
</tr>
<tr>
<td>116</td>
<td>0x074</td>
<td>Read Digital I/O Status</td>
</tr>
<tr>
<td>128</td>
<td>0x080</td>
<td>Enable Bus Command Handler</td>
</tr>
<tr>
<td>253</td>
<td>0x0FD</td>
<td>No operation</td>
</tr>
<tr>
<td>254</td>
<td>0x0FE</td>
<td>Reset Indicator</td>
</tr>
<tr>
<td>256</td>
<td>0x100</td>
<td>Return Status and Weight (float)</td>
</tr>
<tr>
<td>268</td>
<td>0x10C</td>
<td>Enter Tare (float)</td>
</tr>
<tr>
<td>288</td>
<td>0x120</td>
<td>Read Gross (float)</td>
</tr>
<tr>
<td>289</td>
<td>0x121</td>
<td>Read Net (float)</td>
</tr>
<tr>
<td>290</td>
<td>0x122</td>
<td>Read Tare (float)</td>
</tr>
<tr>
<td>293</td>
<td>0x125</td>
<td>Read Current Display (float)</td>
</tr>
<tr>
<td>294</td>
<td>0x126</td>
<td>Read Accumulator (float)</td>
</tr>
<tr>
<td>295</td>
<td>0x127</td>
<td>Read Rate of change (float) 1280 only</td>
</tr>
<tr>
<td>304</td>
<td>0x130</td>
<td>Set Setpoint Value (float)</td>
</tr>
<tr>
<td>305</td>
<td>0x131</td>
<td>Set Setpoint Hysteresis (float)</td>
</tr>
<tr>
<td>306</td>
<td>0x132</td>
<td>Set Setpoint Bandwidth (float)</td>
</tr>
<tr>
<td>307</td>
<td>0x133</td>
<td>Set Setpoint Preact (float)</td>
</tr>
<tr>
<td>320</td>
<td>0x140</td>
<td>Read Setpoint Value (float)</td>
</tr>
<tr>
<td>321</td>
<td>0x141</td>
<td>Read Setpoint Hysteresis (float)</td>
</tr>
<tr>
<td>322</td>
<td>0x142</td>
<td>Read Setpoint Bandwidth (float)</td>
</tr>
<tr>
<td>323</td>
<td>0x143</td>
<td>Read Setpoint Preact (float)</td>
</tr>
</tbody>
</table>

Table 3-2. Remote Commands (Continued)
3.1.2 BYTE Swapping

See the Ports Menu in the indicator manual.

The indicator sends and receives data in integer format. The standard format is as follows for all input and output values:

- High BYTE – Low BYTE

If the indicator FLDBUS/SWAP parameter is set to YES, then the BYTE order changes to:

- Low BYTE – High BYTE

Example:

If the weight on the scale reads 10 lbs and a value of 2560 is displayed in the PLC, either swap the BYTES in the PLC or change the SWAP parameter to YES.

3.1.3 Status Data

Indicator status data is returned in the second word (see Table 3-3). Batch commands return batch status in place of the low byte (see Table 3-4). Setpoint commands return batch status in the low byte of the status word and the setpoint number in the high byte.

<table>
<thead>
<tr>
<th>Word 2 Bit</th>
<th>Indicator Status Data</th>
<th>Value=0</th>
<th>Value=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Error ** (See “Bit-0 Errors” on page 8.)</td>
<td>No error</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Tare not entered</td>
<td>Tare entered</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Not center of zero</td>
<td>Center of zero</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Weight invalid</td>
<td>Weight OK</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Standstill</td>
<td>In motion</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Primary units</td>
<td>Other units</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Tare not acquired</td>
<td>Tare acquired</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Gross weight</td>
<td>Net weight</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Channel number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>NOTE: Least significant bit first.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Not used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Integer data</td>
<td>Floating point data</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Positive weight</td>
<td>Negative weight</td>
<td></td>
</tr>
</tbody>
</table>

This error condition does not necessarily mean the weight being reported is invalid. Refer to the “Weight invalid” bit.

Table 3-3. Indicator Status Data Format

Bit-0 Errors

- PLC command failed to execute.
- No configuration has taken place.
- Scale parameter is out of range.
- Print error has occurred.
- Load error has occurred.
- Memory error has occurred.
- Analog to digital converter error.
- Tare error.
• Scale over range error.
• Scale under range error.
• Non-recoverable configuration store error.
• Indicator in configuration mode.

<table>
<thead>
<tr>
<th>Word 2 Bit</th>
<th>Batch Function Status Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value=0</td>
</tr>
<tr>
<td>00</td>
<td>Digital input 4 OFF</td>
</tr>
<tr>
<td>01</td>
<td>Digital input 3 OFF</td>
</tr>
<tr>
<td>02</td>
<td>Digital input 2 OFF</td>
</tr>
<tr>
<td>03</td>
<td>Digital input 1 OFF</td>
</tr>
<tr>
<td>04</td>
<td>Batch not paused</td>
</tr>
<tr>
<td>05</td>
<td>Batch not running</td>
</tr>
<tr>
<td>06</td>
<td>Batch not stopped</td>
</tr>
<tr>
<td>07</td>
<td>Alarm OFF</td>
</tr>
<tr>
<td>08</td>
<td>Setpoint number</td>
</tr>
<tr>
<td>09</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Not used</td>
</tr>
<tr>
<td>14</td>
<td>Integer data</td>
</tr>
<tr>
<td>15</td>
<td>Positive weight</td>
</tr>
<tr>
<td></td>
<td>Floating point data</td>
</tr>
</tbody>
</table>

**Table 3-4. Batch Function Status Data Format**

3.1.4 **Value**

Weight data is returned to the primary in the third and fourth words of the input command format, depending on the command and the value type. The weight data returned is the displayed weight after the command is executed, unless the command specifies otherwise.

A negative value is returned in the two’s compliment format.

3.1.5 **Setting a Float Value:**

Setting a float value in a setpoint requires the value to be sent in two separate integer values. Most PLCs have a mechanism to take a float value and separate it into integer values.

Example: The following must be sent in the output words to set the value of Setpoint #1 to 10000.

Command word = 304
Parameter word = 1
MSW = 17948
LSW = 16384

3.1.6 **Reading a Float Value:**

When a float value is read it will be returned in two integers representing the float value.

The PLC must combine MSW and LSW integer values back into a float value.

Example: The following is returned in the input words if the weight on the scale is 800.5.

Command Word = 288
Status word = Scale status
MSW= 17480
LSW = 8192
3.2 Command Descriptions

Return Status and Current Weight as Integer
Command: 0, 0x000
Parameter: Scale number
Command 0 returns the status and gross or net scale weight (per scale configuration) of the specified scale in integer format, without changing the display. This command also causes the format-independent commands to return a value in the integer format.

Display Channel
Command: 1, 0x001
Parameter: Scale number
Command 1 returns and displays the weight of the specified scale in its current mode and format.

Display Gross Weight
Command: 2, 0x002
Parameter: Scale number
Command 2 returns and displays the gross weight of the specified scale.

Display Net Weight
Command: 3, 0x003
Parameter: Scale number
Command 3 returns and displays the net weight of the specified scale.

Gross/Net Key Press (toggle mode)
Command: 9, 0x009
Parameter: Scale number
Command 9 toggles between gross and net mode (and count mode, if enabled). If a scale number other than 0 is specified, the action will not be seen until the specified scale is displayed.

Zero
Command: 10, 0x00A
Command 10 performs a ZERO operation on the current scale.

Display Tare
Command: 11, 0x00B
Parameter: Scale number
Command 11 returns and displays the tare weight on the specified scale. If a scale number other than 0 is specified, the indicator first displays the specified scale. The display returns to the prior mode after checking the indicator.

Enter Tare (integer)
Command: 12, 0x00C
Parameter: Scale number
Value: Tare weight
Command 12 enters a tare for the scale selected. Tare data must be in integer format. The indicator continues to return weight data in the current mode for the specified scale.

Acquire Tare (simulate TARE key press)
Command: 13, 0x00D
Parameter: Scale number
Command 13 acquires a tare based on the current weight on the specified scale. The indicator continues to return weight data in the current mode for the specified scale.
Clear Tare
Command: 14, 0x00E
Parameter: Scale number
Command 14 clears the tare for the specified scale. The indicator continues to return weight data in the current mode for the specified scale.

Primary Units
Command: 16, 0x010
Parameter: Scale number
Command 16 switches the current format of the specified scale to the primary units configured for that scale.

Secondary Units
Command: 17, 0x011
Parameter: Scale number
Command 17 switches the current format of the specified scale to the secondary units configured for that scale.

Tertiary Units
Command: 18, 0x012
Parameter: Scale number
Command 18 switches the current format of the specified scale to the tertiary units configured for that scale, if available.

Units Key Press (toggle units)
Command: 19, 0x013
Parameter: Scale number
Command 19 toggles between primary and secondary units of the specified scale.

Print Request
Command: 20, 0x014
Parameter: Scale number
Command 20 executes a print command for the current scale.

Display Accumulator
Command: 21, 0x015
Parameter: Scale number
Command 21 returns and displays the value of the accumulator for the specified scale. This command is valid only when the accumulator for the specified scale is enabled.

Clear Accumulator
Command: 22, 0x016
Parameter: Scale number
Command 22 clears the value of the accumulator for the specified scale. This command is valid only when the accumulator for the specified scale is enabled.

Push Weight to Accumulator
Command: 23, 0x017
Parameter: Scale number
Command 23 adds the net weight on the specified scale to the value of the accumulator for the specified scale. The scale must return to net zero between accumulations. The indicator returns the accumulated weight data for the specified scale. This command is valid only when the accumulator for the specified scale is enabled.

Return Gross as Integer
Command: 32, 0x020
Parameter: Scale number
Command 32 returns the gross weight value for the specified scale as an integer.
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**Return Net as Integer**
Command: 33, 0x021  
Parameter: Scale number  
Command 33 returns the net weight value for the specified scale as an integer.

**Return Tare as Integer**
Command: 34, 0x022  
Parameter: Scale number  
Command 34 returns the tare weight value for the specified scale as an integer.

**Return Current Display as Integer**
Command: 37, 0x025  
Parameter: Scale number  
Command 37 returns the weight value for the specified scale as currently displayed. This may include gross, net, tare, or accumulator values, as enabled.

**Return Accumulator as Integer**
Command: 38, 0x026  
Parameter: Scale number  
Command 38 returns the accumulator value for the specified scale. This command is valid only when the accumulator for the specified scale is enabled.

**Return Rate of Change as Integer**
Command: 39, 0x027  
Parameter: Scale number  
Command 39 returns the current rate of change value for the specified scale.  
*This command is valid only for the 1280.*

**Set Batching State**
Command: 95, 0x05F  
Parameter: State (0 = off; 1 = auto; 2 = manual)  
Command 95 sets the batching (BATCHNG) parameter. Indicator status is returned with the current weight for the last scale specified.

**Batch Start**
Command: 96, 0x060  
Parameter: Scale number  
Command 96 starts a batch program from the current step after a stop, pause, or reset. Batch status is returned with the current weight for the specified scale.

**Batch Pause**
Command: 97, 0x061  
Parameter: Scale number  
Command 97 pauses a batch program at the current step. Batch status is returned with the current weight for the specified scale.

**Batch Reset**
Command: 98, 0x062  
Parameter: Scale number  
Command 98 stops a batch program and resets it to the first batch step. Batch status is returned with the current weight for the specified scale.
Batch Status
Command: 99, 0x063
Parameter: Scale number
Command 99 returns the status of a batch. Batch status is returned with the current weight for the specified scale.

Lock Front Panel of Indicator
Command: 112, 0x070
Parameter: Scale number
Command 112 disables all the keys on the front panel of the indicator. Indicator status is returned with the current weight for the specified scale.

Unlock Front Panel of Indicator
Command: 113, 0x071
Parameter: Scale number
Command 113 enables all the keys on the front panel of the indicator. Indicator status is returned with the current weight for the specified scale.

Set Digital Output ON
Command: 114, 0x072
Parameter: Slot number
Value: Bit number
Command 114 sets the specified digital output ON (active). Use slot number 0 for onboard digital outputs. Indicator status is returned with the current weight for the last scale specified.

Set Digital Output OFF
Command: 115, 0x073
Parameter: Slot number
Value: Bit number
Command 115 sets the specified digital output OFF (inactive). Use slot number 0 for onboard digital outputs. Indicator status is returned with the current weight for the last scale specified.

Read Digital I/O
Command: 116, 0x074
Parameter: Slot number
Command 116 returns the status for all digital I/O in the specified slot in words 3 and 4. Use slot number 0 for onboard digital I/O. Indicator status is returned in the status area for the last scale specified.

Enable Bus Command Handler
Command: 128, 0x80
Parameter: None
Command 128 enables the bus command handler in a user program. While this handler is enabled, all other PLC commands are disabled.

No Operation
Command: 253, 0x0FD
Parameter: Scale number
Command 253 provides a command to use between operations, as necessary, without causing the indicator to perform any action. Indicator status and weight for the specified scale is returned.

Reset Indicator
Command: 254, 0x0FE
Parameter: None
Command 254 remotely resets the indicator. No data is returned.
**Return Status and Current Weight as Float**
Command: 256, 0x100
Parameter: Scale number
Command 256 returns the status and weight of the specified scale in floating-point format, without changing the display. This command also causes the format-independent commands to return a value in the floating-point format. Returns current weight at a floating-point format.

**Enter Tare as Float**
Command: 268, 0x10C
Parameter: Scale number
Value: Tare weight
Command 268 enters a tare for the scale selected in floating-point format. The indicator returns the tare weight as taken, or 0 for no tare.

**Read Gross Weight as Float**
Command: 288, 0x120
Parameter: Scale number
Command 288 returns the gross weight value for the specified scale in floating-point format.

**Read Net Weight as Float**
Command: 289, 0x121
Parameter: Scale number
Command 289 returns the net weight value for the specified scale in floating-point format.

**Read Tare as Float**
Command: 290, 0x122
Parameter: Scale number
Command 290 returns the tare weight value for the specified scale in floating-point format.

**Read Current Display as Float**
Command: 293, 0x125
Parameter: Scale number
Command 293 returns the weight value for the specified scale as currently displayed in floating-point format. This may include gross, net, tare, or accumulator values, as enabled. The weight value is returned in the mode used to display a scale widget.

**Read Accumulator as Float**
Command: 294, 0x126
Parameter: Scale number
Command 294 returns the accumulator value for the specified scale in floating-point format. Batch status is returned in place of the indicator status.

**Read Rate of Change as Float**
Command: 295, 0x127
Parameter: Scale number
Command 295 returns the current rate of change value for the specified scale in floating-point format. *This command is valid only for the 1280.*

**Set Setpoint Value as Float**
Command: 304, 0x130
Parameter: Setpoint number
Value: Setpoint value
Command 320 sets the setpoint value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a setpoint value. Batch status is returned in place of the indicator status.
Set Setpoint Hysteresis as Float
Command: 305, 0x131
Parameter: Setpoint number
Value: Hysteresis value
Command 305 sets the hysteresis value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a hysteresis value. Batch status is returned in place of the indicator status.

Set Setpoint Bandwidth as Float
Command: 306, 0x132
Parameter: Setpoint number
Value: Bandwidth value
Command 306 sets the bandwidth value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a bandwidth value. Batch status is returned in place of the indicator status.

Set Setpoint Preact as Float
Command: 307, 0x133
Parameter: Setpoint number
Value: Preact value
Command 307 sets the preact value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a preact value. Batch status is returned in place of the indicator status.

Read Setpoint Value as Float
Command: 320, 0x140
Parameter: Setpoint number
Command 320 returns the target value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a target value. Batch status is returned in place of the indicator status.

Read Setpoint Hysteresis as Float
Command: 321, 0x141
Parameter: Setpoint number
Command 321 returns the hysteresis value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a hysteresis value. Batch status is returned in place of the indicator status.

Read Setpoint Bandwidth as Float
Command: 322, 0x142
Parameter: Setpoint number
Command 322 returns the bandwidth value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a bandwidth value. Batch status is returned in place of the indicator status.

Read Setpoint Preact as Float
Command: 323, 0x143
Parameter: Setpoint number
Command 323 returns the preact value for the specified setpoint in floating-point format. This command is valid only when the setpoint is configured and requires a preact value. Batch status is returned in place of the indicator status.
4.0 Appendix

4.1 Configuring the Network settings

Configuring the network setting is done using a web browser or the Anybus IP configuration utility.

To set the network settings using a web browser.

Open a browser and type the IP address of the card.
Change any or all settings.
Click on Store settings.

To set the network settings using the Anybus IP Configuration program.

Open the configuration program found on the CD.
Click on Scan button if the device does not display in the menu.
Double click on the device. A menu is displayed with the current network settings.
Change any or all settings.
Click on the Set button.
Change any or all settings and click on the Set button.

![Figure 4-1. PROFINET Configuration Screen Using a Web Browser](image-url)
4.2 Configuration Procedure for 920i and PLC

Output and input data must be configured in the PLC for PROFINET to work correctly. Consult Siemens for additional information on configuration if unfamiliar or unsure of configuration procedure. Figure 4-2 shows the configuration screen using the Siemens TIA Portal software.

![Figure 4-2. Siemens TIA Portal IO Configuration](image)

**Note** Outputs need to be shown first on the available choices.

4.3 GSDML File

The GSDML file for the PROFINET adapter is included on the CD (PN 187908) is included with the option. The GSDML file must be installed on the host device to enable communication with the indicator.

4.4 PROFINET Interface Specifications

**Power Requirements**

*Bus Adapter Card with PROFINET Module, DC Power:*
  
  Supply voltage: 6 VDC, supplied by 920i bus
  
  Typical current draw: 270 mA
  
  Power consumption: 1.62 W

*Indicator, Typical AC Load:*

  920i  
  
  Power Consumption (universal model, 32 x 350 ohm load cells)
  
  115 VAC400 mA (46 W)
  
  230 VAC250 mA (58 W)

**Communications Specifications**

PROFINET Network Communications:

  Twisted-pair cabling at 10 or 100Mbps

**Environmental Specifications**

Temperature:  

-10° to +40° C (14° to 104° F)

**CE**

The PROFINET Interface has been found in accordance with EMC directive 89/336/EEC for European standards EN 50081-2 and EN 61000-6-2.
PROFINET Interface for 920i