

PENKO Engineering B.V.

Your Partner for Fully Engineered Factory Solutions



Protocol description:
PENKO SGM720/820 EtherNet/IP



an ETC Company

PENKO EtherNet/IP protocol

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Introduction

EtherNet/IP(TM) is an industrial Ethernet network that combines standard Ethernet technologies with the media-independent Common Industrial Protocol or "CIP."

This document describes the PENKO EtherNet/IP implementation for the PENKO SGM Ethernet devices, the SGM720 and SGM820.



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1 Basics

The EDS information, PENKO devices that support the protocol and the available classes.

1.1 EDS

This document describes the Electronic Data Sheet revision 1.4.0 and the SGM720 class revision 1.4.

EDS filename: **SGM720 SGM820 V1.4.0.EDS**

1.2 Devices

The following PENKO devices support this EDS version:

| Device | EIP |
|---------------|--|
| SGM720 | Yes, starting at version v1.4.3.9.0.1 |
| SGM820 | Yes, starting at version v1.4.3.9.0.1 |

1.3 Classes

The following classes are supported:

| Classes |
|---|
| Class 0x01 - Identity |
| Class 0x02 - Message router |
| Class 0x04 - Assembly |
| Class 0x06 - Connection manager |
| Class 0xF5 - TCP/IP |
| Class 0x300 - Weigher |

For every class the following items are described:

- Class attributes
- Class services/actions for these attributes
- Instance attributes
- Instance services/actions for these attributes



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2 Class 0x01 (1) - Identity

According to the EIP standard, every PENKO device has an Identity object. The devices support one instance of the Identity object.

2.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---------------------------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 1 | Revision of this object. |
| 2 | Get | Max instance | UINT | 1 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 1 | Number of object instances currently created at this class level of the device. |
| 6 | Get | Max ID Number Class Attributes | UINT | 7 | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | Get | Maximum ID Number Instance Attributes | UINT | 7 | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

2.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|---|
| 1 | Get Attribute all | - | Read class attribute 1,2,6,7 |
| 5 | Reset | UINT 0 | Emulate as closely as possible cycling power on the item the <i>Identity Object</i> represents. This value is the default if this parameter is omitted. |
| | | 1 | Return to the factory default configuration, then emulate cycling power. |
| 14 | Get Attribute single | - | Read selected class attribute |

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2.3 Instance Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|----------------|-----------------|--------|--|
| 1 | Get | Vendor ID | UINT | 1240 | Identification of each vendor by number |
| 2 | Get | Device Type | UINT | 12 | Indication of general type of product |
| 3 | Get | Product Code | UINT | 203 | Identification of a particular product of an individual vendor |
| 4 | Get | Revision | STRUCT OF | | Revision of the item the Identity Object represents |
| | | Major Revision | UINT | 1 | |
| | | Minor Revision | UINT | 4 | |
| 5 | Get | Status | WORD | | |
| 6 | Get | Serial Number | UDINT | | Production generated serial number |
| 7 | Get | Product Name | SHORT STRING | SGM720 | Human readable identification |

2.4 Instance Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|---|---|
| 1 | Get Attribute all | - | Read attribute 1-7 |
| 5 | Reset | UINT 0 1 | Emulate as closely as possible cycling power on the item the <i>Identity Object</i> represents. This value is the default if this parameter is omitted. Return to the factory default configuration, and then emulate cycling power. |
| 14 | Get Attribute single | - | Read selected attribute |
| 125 | Execute PDI | Request BYTE ARRAY[] path Reply BYTE ARRAY[] path + BYTE ARRAY[] result | Executes the PDI interface, see examples chapter . |

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3 Class 0x02 (2) - Message router

The object within a node that distributes explicit message requests to the appropriate application objects.

3.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---------------------------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 1 | Revision of this object. |
| 2 | Get | Max instance | UINT | 1 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 1 | Number of object instances currently created at this class level of the device. |
| 6 | Get | Max ID Number Class Attributes | UINT | 7 | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | Get | Maximum ID Number Instance Attributes | UINT | 0 | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

3.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|--------------------------------|
| 1 | Get Attribute all | - | Read class attribute 1,2,3,6,7 |
| 14 | Get Attribute single | - | Read selected class attribute |



Instance attributes and services are not applicable for this class

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4 Class 0x04 (4) - Assembly

Assembly objects provide the option of mapping data from attributes of different instances of various classes into one single attribute, an Assembly Object. This mapping is generally used for I/O messages to maximize the efficiency of the control data exchange on the network.

4.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|--------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 2 | Revision of this object. |
| 2 | Get | Max instance | UINT | 9 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 9 | Number of object instances currently created at this class level of the device. |

4.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|-------------------------|
| 14 | Get Attribute single | - | Read selected attribute |

4.3 Instance Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|--------------|--------------|-------|---|
| 3 | Get | Byte array[] | BYTE ARRAY[] | | Instance depended data, see instance # See examples chapter |

Available instances

Instance 0x0310 (784) Weigher configuration

Instance 0x0311 (785) Weigher

Instance 0x0321 (801) Heartbeat

Instance 0x0360 (864) Device configuration

Instance 0x0364 (868) Device in

Instance 0x0368 (872) Device out

Instance 0x0370 (880) Control configuration

Instance 0x0374 (884) Control in

Instance 0x0378 (888) Control out

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Instance 0x0310 (784) Weigher configuration

| Access | Name | Data type | Description |
|--------|-----------------------|---------------------|-------------------------------|
| | Weigher Configuration | STRUCT OF BYTE[] | Reserved for future operation |

Instance 0x0311 (785) Weigher

| Access | Name | Data type | Description |
|--------|---------|---|--|
| Get | Weigher | STRUCT OF DINT WEIGHER DINT GROSS DINT NET DINT TARE DINT WEIGHERx10 DINT GROSSx10 DINT NETx10 DINT TAREx10 WORD FORMAT WORD STATUS | Display rate weigher data Fast Gross weight Fast Net weight Active Tare weight Display rate weigher data x10 Fast Gross weight x10 Fast Net weight x10 Active Tare weight x10 Format bits, see Weigher-Format word Status bits, see Weigher-Status word |

Instance 0x0321 (801) Heartbeat

| Access | Name | Data type | Description |
|--------|-----------|-----------|-------------|
| | Heartbeat | | Heartbeat |

Instance 0x0360 (864) Device configuration

| Access | Name | Data type | Description |
|---------|-------------------------|-------------------|---|
| Get/Set | Device Configuration | STRUCT OF | |
| | Indicator configuration | WORD offset read | Indicator configuration read offset Default read 1-20 |
| | Register configuration | WORD offset read | Registers configuration offset, not used in SGM720 indicator |
| | Markers | WORD offset input | Markers configuration offset Default read start at 401 (multiple of 8) |

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Instance 0x0364 (868) Device in

| Access | Name | Data type | Description |
|----------------------------|----------------------------|--|--|
| Get | Device In | STRUCT OF | |
| | Weigher | DINT WEIGHER DINT GROSS DINT NET DINT TARE DINT WEIGHERx10 DINT GROSSx10 DINT NETx10 DINT TAREx10 WORD FORMAT WORD STATUS | Display rate weigher data Fast Gross weight Fast Net weight Active Tare weight Display rate weigher data x10 Fast Gross weight x10 Fast Net weight x10 Active Tare weight x10 Format bits, see Weigher-Format word Status bits, see Weigher-Status word |
| | Indicator | ARRAY[20] OF INDICATOR | Read indicators, default start read at 1 |
| | Register read | ARRAY OF DINT[10] | Registers [10], SGM720 indicator: Register 1= Output level 1 Register 2= Output level 2 Register 3= Output level 3 Register 4= Output level 4 Register 5-10= spare= 0 |
| <i>Controller software</i> | ¹ Markers Input | BYTE ARRAY[4] | Markers 4x8=32 default read at 401-432 |
| <i>Indicator software</i> | ² Inputs | BYTE ARRAY[2] | Inputs 1-16 |
| | ² Outputs | BYTE ARRAY[2] | Outputs 201-216 |

¹ In case of controller software the instance numbers are used as markers input

² In case of indicator software the instance numbers are used as inputs and outputs

Instance 0x0368 (872) Device out

| Access | Name | Data type | Description |
|--------|------------------|-----------|---|
| Set | Device Out | STRUCT OF | |
| | Weigher Control | BYTE[2] | Weigher control word, see also Weigher-Control word |
| | Reserved Control | BYTE[2] | Set to 0x0000 |

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Instance 0x0370 (880) Control configuration

| Access | Name | Data type | Description |
|---------|-------------------------|---|---|
| Get/Set | Control Configuration | STRUCT OF | |
| | Indicator configuration | WORD offset read | Indicator configuration read offset, Default read at 1-10 |
| | Register configuration | WORD offset read WORD offset write | Registers configuration offset, not used in SGM720 indicator |
| | Markers | WORD offset input WORD offset output | Markers configuration offset Default read start at 401 (multiple of 8) Default write start at 433 (multiple of 8) |

Instance 0x0374 (884) Control in

| Access | Name | Data type | Description |
|--------|---------------|--|--|
| Get | Control In | STRUCT OF | |
| | Weigher | DINT WEIGHER DINT GROSS DINT NET DINT TARE DINT WEIGHERx10 DINT GROSSx10 DINT NETx10 DINT TAREx10 WORD FORMAT WORD STATUS | Display rate weigher data Fast Gross weight Fast Net weight Active Tare weight Display rate weigher data x10 Fast Gross weight x10 Fast Net weight x10 Active Tare weight x10 Format bits, see Weigher-Format word Status bits, see Weigher-Status word |
| | Indicator | ARRAY[20] OF STRUCT OF INDICATOR | Read indicators, default start read at 1 |
| | Register read | ARRAY OF DINT[10] | Registers [10], SGM720 indicator : Register 1= Output level 1 Register 2= Output level 2 Register 3= Output level 3 Register 4= Output level 4 Register 5-10= spare= 0 |
| | Markers Input | BYTE ARRAY[4] | Markers 4x8=32 default read at 401-432 |

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Instance 0x0378 (888) Control out

| Access | Name | Data type | Description |
|--------|---------------------|----------------------|---|
| Set | Control Out | STRUCT OF | |
| | Weigher Control | ARRAY OF BYTE[2] | Weigher control word, see also Weigher-Control word |
| | Reserved Control | ARRAY OF BYTE[2] | Set to 0x0000 |
| | Register write | ARRAY OF DINT[10] | Registers [10], SGM720 indicator : Register 1= Output level 1 Register 2= Output level 2 Register 3= Output level 3 Register 4= Output level 4 Register 5-10= spare= 0 |
| | Markers Output | BYTE ARRAY[4] | Markers 4x8=32 default write at 433-464 |

4.4 Indicator Data Type Definition

TYPE OF INDICATOR:

```
STRUCT OF
    BYTE FMTSTAT
    BYTE WEIGHT [3];
```

4.5 Weigher-Status word

| Bit # | Called | Definition |
|-------|--------------|--|
| 0 | OVERLOAD | Hardware overload/underload detected on loadcell |
| 1 | MAXLOAD | Overload detected on loadcell |
| 2 | STABLE | Weigher signal is stable |
| 3 | STABLE RANGE | Weigher signal is in stable range |
| 4 | ZERO SET | Weigher zero is corrected |
| 5 | ZERO CENTER | Weigher in center of zero range |
| 6 | ZERO RANGE | Weigher is in zero range, zero is possible |
| 7 | ZERO TRACK | Weigher signal is in zero tracking range, zero tracking is possible |
| 8 | TARE | Weigher tare is active |
| 9 | PTARE | Weigher preset tare is active |
| 10 | SAMPLE | Used by internal process handling |
| 11 | BAD CAL | Calibration is bad, invalid, not available |
| 12 | CAL ENABLED | Calibration is enabled, used by internal process handling |
| 13 | INDUSTRIAL | If set weigher runs in industrial mode, if reset weigher runs certified operation mode |
| 14 | NOT LEVEL | Weigher system in blocking, warming up or scale is not level |
| 15 | RESERVED | Reserved mode always 0 |

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4.6 Weigher-Control word

| Bit # | Called | Definition |
|-------|--------------|--|
| 0 | ZERO_RESET* | Reset the actual zero weight, condition only possible in noncertified mode |
| 1 | ZERO_SET* | Activate new zero weight, condition stable signal |
| 2 | TARE_OFF* | Switch actual tare weight off |
| 3 | TARE_ON* | Activate new tare weight, condition stable signal |
| 4 | TARE_TOGGLE* | Toggle the Tare weight on condition stable signal, off condition none |
| 5-16 | RESERVED | Reserved bits always 0 |

*Remark: action on rising edge of bit

4.7 Weigher-Format word

| Bit number | Description |
|------------|-------------------------|
| #15 | Signed/unsigned |
| | 0 = Unsigned |
| | 1 = Signed |
| #14 | Zero suppressing |
| | 0 = Nonzero suppressing |
| | 1 = Zero suppressing |
| #11 - #8 | Display step size |
| | 0000 = Step 1 |
| | 0001 = Step 2 |
| | 0010 = Step 5 |
| | 0011 = Step 10 |
| | 0100 = Step 20 |
| | 0101 = Step 50 |
| | 0110 = Step 100 |
| | 0111 = Step 200 |
| | 1000 = Step 500 |
| | 1001 = Step 1000 |
| | 1010 = Step 2000 |
| | 1011 = Step 5000 |
| #2 - #0 | Decimal point position |
| | 000 = 000000 |
| | 001 = 00000.0 |
| | 010 = 0000.00 |
| | 011 = 000.000 |
| | 100 = 00.0000 |
| | 101 = 0.00000 |

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4.8 Instance Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|--------------------------|
| 14 | Get Attribute single | - | Read selected attribute |
| 16 | Set Attribute single | Data | Write selected attribute |

4.9 Exclusive Owner Connections

| Connection | Name | Assembly O->T | Assembly T->O | Assembly Configuration | Description |
|------------|---------|------------------|------------------|---------------------------|---|
| 1 | DEVICE | 872 | 868 | 864 | Read Weigher, Read Indicators, Read Registers, Read Markers and Weigher Control. |
| 2 | CONTROL | 888 | 884 | 880 | Read Weigher, Read Indicators, Read/Write Registers, Read/Write Markers, Weigher Control. |

4.10 Input Only Connections

| Connection | Name | Assembly O->T | Assembly T->O | Assembly Configuration | Description |
|------------|---------|------------------|------------------|---------------------------|---------------------|
| 1 | Weigher | 801 | 785 | 768 | Weigher 1 live data |

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5 Class 0x06 (6) - Connection manager

The Connection manager describes connections supported by the PENKO device.

5.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---------------------------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 1 | Revision of this object. |
| 2 | Get | Max instance | UINT | 1 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 1 | Number of object instances currently created at this class level of the device. |
| 6 | Get | Max ID Number Class Attributes | UINT | 7 | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | Get | Maximum ID Number Instance Attributes | UINT | 0 | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

5.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|--------------------------------|
| 1 | Get Attribute all | - | Read class attribute 1,2,3,6,7 |
| 14 | Get Attribute single | - | Read selected class attribute |



Instance attributes and services are not applicable for this class

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6 Class 0xF5 (245) - TCP/IP

The TCP/IP Interface object provides a mechanism for configuring a device's TCP/IP network interface. Examples of configurable items include the device's IP address, network mask and gateway address.

6.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---------------------------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 1 | Revision of this object. |
| 2 | Get | Max instance | UINT | 1 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 1 | Number of object instances currently created at this class level of the device. |
| 6 | Get | Max ID Number Class Attributes | UINT | 7 | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | Get | Maximum ID Number Instance Attributes | UINT | 6 | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

6.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|--------------------------------|
| 1 | Get Attribute all | - | Read class attribute 1,2,3,6,7 |
| 14 | Get Attribute single | - | Read selected class attribute |

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6.3 Instance Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---|--|-------|--|
| 1 | Get | Status | DWORD | | Interface status, see Vol21.11 5-3.3.2.1 |
| 2 | Get | Configuration Capability | DWORD | | Interface capability flags, , see Vol21.11 5-3.3.2.2 |
| 3 | Get | Configuration Control | DWORD | | Interface control flags, , see Vol21.11 5-3.3.2.3.1 |
| 4 | Get | Physical Link Object | STRUCT of UINT EPATH | | Physical link object, see also Vol21.11 Path Size Path |
| 5 | Get | Interface configuration IP Address Network Gateway Address Name Server Name Server2 Domain Name | STRUCT OF UDINT UDINT UDINT UDINT UDINT UDINT UDINT UDINT UDINT STRING | | |
| 6 | Get | Host Name | STRING | | |

6.4 Instance Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|--------------------------------|
| 1 | Get Attribute all | - | Read class attribute 1,2,3,6,7 |
| 14 | Get Attribute single | - | Read selected class attribute |

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7 Class 0x300 (768) - Weigher

The weigher class is a custom PENKO class used to read/write weigher data.

7.1 Class Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|---------------------------------------|-----------|-------|---|
| 1 | Get | Revision | UINT | 2 | Revision of this object. |
| 2 | Get | Max instance | UINT | 1 | Maximum instance number of an object currently created in this class level of the device. |
| 3 | Get | Number of instance | UINT | 1 | Number of object instances currently created at this class level of the device. |
| 6 | Get | Max ID Number Class Attributes | UINT | 7 | The attribute ID number of the last class attribute of the class definition implemented in the device. |
| 7 | Get | Maximum ID Number Instance Attributes | UINT | 18 | The attribute ID number of the last instance attribute of the class definition implemented in the device. |

7.2 Class Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|------------|-------------------------------|
| 1 | Get Attribute all | - | Read class attribute 1,2,6,7 |
| 14 | Get Attribute single | - | Read selected class attribute |

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7.3 Instance Attributes

| Number | Access | Name | Data type | Value | Description |
|--------|--------|----------------|-----------|-------|--|
| 1 | Get | WEIGHER | DINT | | Display rate weigher data including multi range/interval step size |
| 2 | Get | FAST GROSS | DINT | | Unfiltered weigher data gross |
| 3 | Get | FAST NET | DINT | | Unfiltered weigher data net |
| 4 | Get | GROSS | DINT | | Display rate weigher data gross |
| 5 | Get | NET | DINT | | Display rate weigher data net |
| 6 | Get | TARE | DINT | | Active tare weight |
| 7 | Get | PEAK | DINT | | Measured peak weight since last reset |
| 8 | Get | VALLEY | DINT | | Measured valley weight since last reset |
| 9 | Get | WEIGHER x10 | DINT | | Display rate weigher data x10 |
| 10 | Get | FAST GROSS x10 | DINT | | Unfiltered weigher data gross x10 |
| 11 | Get | FAST NET x10 | DINT | | Unfiltered weigher data net x10 |
| 12 | Get | GROSS x10 | DINT | | Display rate weigher data gross x10 |
| 13 | Get | NET x10 | DINT | | Display rate weigher data net x10 |
| 14 | Get | TARE x10 | DINT | | Active tare weight x10 |
| 15 | Get | PEAK x10 | DINT | | Measured peak weight since last reset x10 |
| 16 | Get | VALLEY x10 | DINT | | Measured valley weight since last reset x10 |
| 17 | Get | SAMPLE | DINT | | Internal resolution |
| 18 | Get | STATUS | WORD | | Weigher status bits Instance Attributes Status |

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7.4 Instance Attributes Status

| Bit # | Called | Definition |
|-------|--------------|--|
| 0 | OVERLOAD | Hardware overload/underload detected on loadcell |
| 1 | MAXLOAD | Overload detected on loadcell |
| 2 | STABLE | Weigher signal is stable |
| 3 | STABLE RANGE | Weigher signal is in stable range |
| 4 | ZERO SET | Weigher zero is corrected |
| 5 | ZERO CENTER | Weigher in center of zero range |
| 6 | ZERO RANGE | Weigher is in zero range, zero is possible |
| 7 | ZERO TRACK | Weigher signal is in zero tracking range, zero tracking is possible |
| 8 | TARE | Weigher tare is active |
| 9 | PTARE | Weigher preset tare is active |
| 10 | SAMPLE | Used by internal process handling |
| 11 | BAD CAL | Calibration is bad, invalid, not available |
| 12 | CAL ENABLED | Calibration is enabled, used by internal process handling |
| 13 | INDUSTRIAL | If set weigher runs in industrial mode, if reset weigher runs certified operation mode |
| 14 | NOT LEVEL | Weigher system in blocking, warming up or scale is not level |
| 15 | RESERVED | Reserved always 0 |

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7.5 Instance Services

| Service code | Name | Parameters | Description |
|--------------|----------------------|---|--|
| 1 | Get Attribute all | - | Read attributes 1-18 |
| 14 | Get Attribute single | - | Read selected attribute |
| 50 | Zero Set | - | Weigher zero function |
| 51 | Zero Reset | - | Weigher zero reset function |
| 52 | Tare On | - | Weigher tare on function |
| 53 | Tare Off | - | Weigher tare off function |
| 54 | Tare Toggle | - | Weigher tare toggle function |
| 55 | Preset Tare | Tare weight DINT | Weigher preset tare function |
| 56 | Hold Set | - | Weigher hold set function, Not available in revision 1.1 |
| 57 | Peak Reset | - | Weigher peak reset function Not available in revision 1.1 |
| 58 | Valley Reset | - | Weigher valley reset function Not available in revision 1.1 |
| 64 | Calibrate Zero | Security code= 0x0055AAFF | Actual weight is 0 |
| 65 | Calibrate Span | Security code= 0x0055AAFF Weight DINT | Calibrate Span Actual weight on scale |
| 66 | Calibrate mV | Security code= 0xFFAA5500 mV DINT Max.loadcell | Removed the deadload, the span is unattended fixed point 0.00000mV Maximum weigh performance loadcell |
| 67 | Calibrate Deadload | Security code= 0xFFAA5500 Weight DINT | Measure the deadload and correct, the span is unattended. Correction weight if scale is not empty |
| 80 | Register Functions | DINT in[4] DINT out[4] | See Register Functions In parameters Output parameters |

[See examples chapter](#)

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8 Register functions

By using register functions, all device parameters can be read and/or written.

In other PENKO protocols these functions use the device registers to send and receive data. With EtherNet/IP, complete blocks of data can be sent, making the use of the device registers unnecessary.

Register functions are found in the Weigher class, class 0x0300 (768), instance service 80.

The following parameters are used:

| Parameter | Data type |
|--------------------|-----------|
| Input - parameters | DINT [4] |
| Output - result | DINT [4] |

Input:

| Parameter | Data type | Description |
|-----------|-----------|--|
| 1 | DINT | Low 2 bytes = function code High 2 bytes = 0 |
| 2 | DINT | Input parameter, depending on function code |
| 3 | DINT | Input parameter, depending on function code |
| 4 | DINT | Input parameter, depending on function code |

Output:

| Result | Data type | Description |
|--------|-----------|---|
| 1 | DINT | Low 2 bytes = function code High 2 bytes = error code |
| 2 | DINT | Result, depending on function code |
| 3 | DINT | Result, depending on function code |
| 4 | DINT | Result, depending on function code |

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8.1 Function codes

The following function codes are present:

| Name | Code | Description |
|---------------------------|------|---|
| NOP | 0 | No Operation |
| CAL_ZERO | 1 | Calibrate zero by weight |
| CAL_SPAN | 2 | Calibrate span by weight |
| CAL_MV | 3 | Calibrate in mV/V |
| CAL_DEADLOAD | 4 | Calibrate dead load by measuring weight |
| CAL_INSERT | 5 | Calibrate multipoint insert by measuring weight |
| CAL_POINT | 6 | Calibrate multipoint read point at parameter index |
| CAL_DELETE | 7 | Calibrate multipoint delete point at parameter index |
| CAL_GEOGRAPHIC_ORIGIN_SET | 8 | Calibrate set geographic origin calibration |
| CAL_GEOGRAPHIC_ORIGIN_GET | 9 | Calibrate get geographic origin calibration |
| CAL_GEOGRAPHIC_LOCAL_SET | 10 | Calibrate set geographic local calibration |
| CAL_GEOGRAPHIC_LOCAL_GET | 11 | Calibrate get geographic local calibration |
| | | |
| IND_MAXLOAD_SET | 101 | Indicator set maximum load |
| IND_MAXLOAD_GET | 102 | Indicator get maximum load |
| | | |
| PDI_PATH_SET | 201 | PDI path set |
| PDI_PROPERTY_SET | 202 | PDI property set |
| PDI_PROPERTY_GET | 203 | PDI property get |
| | | |
| PRINT | 301 | Print ticket or line to printer |
| PRINT_SUBTOTAL | 302 | Subtotals to printer not supported by SGM series |
| PRINT_TOTAL | 303 | Totals to printer |
| PRINT_DAYTOTAL | 304 | Day totals to printer not supported by SGM series |
| PRINT_BATCHTOTAL | 305 | Batch totals to printer not supported by SGM series |
| PRINT_LAYOUT | 306 | Custom total layout to printer not supported by SGM series and 1020 |
| PRINT_ALIBI | 307 | Print to Alibi memory not supported by SGM700 series |
| PRINT_ALIBIMEMORY | 308 | print full alibi memory to printer not supported by SGM700 series |
| PRINT_EVENTMEMORY | 309 | print full event memory to printer not supported by SGM700 series |
| | | |
| TOTAL_TOTALIZE | 401 | Totalize actual stable weight |
| TOTAL_SUBTOTAL | 402 | Read or reset actual subtotal |
| TOTAL_TOTAL | 403 | Read or reset actual totals |
| TOTAL_DAYTOTAL | 404 | Read or reset actual day totals |
| TOTAL_BATCHTOTAL | 405 | Read or reset actual batch totals |
| | | |
| | | |



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| | | |
|-------------------------|-----|---------------------------------|
| RFN_PROCESS_RECIPES_GET | 501 | Read MFL/CHK/BLT recipe |
| RFN_PROCESS_RECIPES_SET | 502 | Write MFL/CHK/BLT recipe |
| RFN_PROCESS_CONFIG_GET | 601 | Read MFL/CHK/BLT configuration |
| RFN_PROCESS_CONFIG_SET | 602 | Write MFL/CHK/BLT configuration |
| RFN_PROCESS_DATA | 701 | Read MFL/CHK/BLT process data |

8.2 Error codes

The following error codes are present:

| Name | Code | Description |
|-------------------------|-------------|--|
| SUCCESS | 0 | Function successful |
| WRN_WARNING | 1000 | System warnings: |
| WRN_TIMEOUT | 1001 | Generic time-out warning |
| WRN_TOLOW | 1002 | Generic parameter to low warning |
| WRN_TOHIGH | 1003 | Generic parameter to high warning |
| WRN_ZERO | 1004 | Generic parameter/result is zero warning |
| WRN_NOTZERO | 1005 | Generic parameter/result is not zero warning |
| WRN_POSITIVE | 1006 | Generic parameter is positive warning |
| WRN_NEGATIVE | 1007 | Generic parameter is negative warning |
| WRN_FULL | 1008 | Generic something is full warning |
| WRN_EMPTY | 1009 | Generic something is empty warning |
| WRN_NOTFOUND | 1010 | Generic search not found warning |
| WER_WARNING | 1100 | Weigher warnings: |
| WER_NO_TARE | 1101 | Zero tare level, tare rst |
| ERR_ERROR | 2000 | System errors: |
| ERR_PARAMETER_INCORRECT | 2001 | Generic parameter error |
| ERR_TIMEOUT | 2002 | Generic time-out error |
| ERR_TOLOW | 2003 | Generic parameter to low error |
| ERR_TOHIGH | 2004 | Generic parameter to high error |
| ERR_ZERO | 2005 | Generic parameter/result is zero error |
| ERR_NOTZERO | 2006 | Generic parameter/result is not zero error |
| ERR_POSITIVE | 2007 | Generic parameter is positive error |
| ERR_NEGATIVE | 2008 | Generic parameter is negative error |
| ERR_FULL | 2009 | Generic something is full error |
| ERR_EMPTY | 2010 | Generic something is empty error |
| ERR_NOTFOUND | 2011 | Generic search not found error |
| ERR_FILE_NOT_FOUND | 2012 | Generic file not found error |
| WER_ERROR | 2100 | Weigher errors: |
| WER_NOT_STABLE | 2101 | Weigher not stable |



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| | | |
|--------------------------|-------------|--|
| WER_ABOVE_MAXLOAD | 2102 | Parameter above max load |
| WER_BELOW_ZERO | 2103 | Parameter below zero |
| WER_NOT_IN_ZERO_RANGE | 2104 | Not in zero range |
| WER_ARITHMIC_OVERFLOW | 2105 | Arrhythmic overflow occurred |
| WER_ADC_OVERFLOW | 2106 | A/D reads all 1's |
| WER_ADC_UNDERFLOW | 2107 | A/D reads all 0's |
| WER_GAIN_NEGATIVE | 2108 | Gain ref. < zero ref. |
| WER_GAIN_OVERFLOW | 2109 | Gain limit |
| WER_SAVE | 2110 | Save errors: |
| WER_SAVE_FLASH_EXHAUSTED | 2111 | Flash ROM exhausted |
| WER_SAVE_CREATE_HEADER | 2112 | Error on header creation |
| WER_SAVE_DATA_WRITE | 2113 | Error on data write |
| WER_SAVE_HEADER_VALIDATE | 2114 | Header validation failed |
| WER_SAVE_DEACTIVATE | 2115 | Deactivate old data fail |
| WER_LOAD | 2116 | Load errors |
| WER_LOAD_NOT_FOUND | 2117 | Item not found in store |
| WER_LOAD_DATA_ERROR | 2118 | Error in stored data |
| WER_BAD_CALIBRATION | 2119 | No calibration available |
| WER_NOT_ENABLED | 2120 | Action not enabled |
| WER_MCAL_NOT_FOUND | 2121 | Multi-point not found |
| WER_MCAL_OVERFLOW | 2122 | Calibration table full |
| WER_TARE_ACTIVE | 2123 | Not allowed, tare active |
| WER_NOT_ALLOWED | 2124 | Action is not allowed |
| WER_ADC_NOPOWER | 2125 | ADC has no power |
| ERR_DOSER | 2200 | Doser errors |
| ERR_POSITION | 2300 | Position errors |
| ERR_SPCAPP | 2400 | SPC-application errors |
| ERR_SCOPE | 2500 | Scope errors |
| ERR_INTERPRETER | 2600 | Interpreter errors |
| ERR_USB | 3000 | USB errors - use USB routines for returning error texts |
| ERR_FLASH | 3100 | FLASH file system errors |

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8.3 Calibration functions

This chapter describes the calibration function codes.

8.3.1 CAL_ZERO

Calibrate zero by weight. Function code = 1.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 1 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 1 | Not used | Not used | Not used |

8.3.2 CAL_SPAN

Calibrate span by weight. Function code = 2.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 2 | Span weight | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 2 | Not used | Not used | Not used |

Example - calibrate span on 1.200kg:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 2 | 1200 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 2 | Not used | Not used | Not used |

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Example - calibrate span without loading scale - will result in **error**:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 2 | 1200 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|-----------|----------|----------|----------|
| 138215426 | Not used | Not used | Not used |

The result is **138215426**

- The function code (low word) is **2**
- The error code (high word) is **2109 - WER_GAIN_OVERFLOW, Gain limit**

8.3.3 CAL_MV

Theoretic calibration by millivolts. Function code = 3.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------------|------------------------|-------------|
| 3 | Fixed point mV/V value | Maximum weight at mV/V | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 3 | Not used | Not used | Not used |

Example - theoretic calibration of load cell 200kg @ 2.0012mV/V:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 3 | 20012 | 200 | Not used |

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8.3.4 CAL_DEADLOAD

Calibrate dead load by measuring weight. Function code = 4.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------------|-------------|-------------|
| 4 | Actual weight on scale | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 4 | Not used | Not used | Not used |

Example - calibration of dead load with 12kg on the scale:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 4 | 12 | Not used | Not used |

8.3.5 CAL_INSERT

Multipoint calibration up to 10 points. Insert or replace a calibration point. Function code = 5.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------------|-------------|-------------|
| 5 | Actual weight on scale | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 5 | Not used | Not used | Not used |

Example - add calibration point of 10.000kg - if the point already exists, its ADC value is replaced:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 5 | 10000 | Not used | Not used |

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8.3.6 CAL_POINT

Multipoint calibration up to 10 points. Read the calibration point at index (1...10). Function code = 6.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|----------------|-------------|-------------|
| 6 | Index (1...10) | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|------------------------------|-------------------|
| 6 | Index | Calibration reference weight | Calibration in mV |

Example - read calibration point 1 (10.000kg @ 9.9975mV/V):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 6 | 1 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 6 | 1 | 10000 | 9.9975 |

8.3.7 CAL_DELETE

Multipoint calibration up to 10 points. Delete the calibration point at index (1...10). Function code = 7.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|----------------|-------------|-------------|
| 7 | Index (1...10) | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 7 | Index | Not used | Not used |

Example - delete calibration point 1:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 7 | 1 | Not used | Not used |

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8.3.8 CAL_GEOGRAPHIC_ORIGIN_SET

Geographic correction. Set the origin calibration location. Function code = 8.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------------------|-------------|-------------|
| 8 | Fixed point latitude degrees | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 8 | Not used | Not used | Not used |

Example - set origin latitude to 50.00 degrees:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 8 | 5000 | Not used | Not used |

8.3.9 CAL_GEOGRAPHIC_ORIGIN_GET

Geographic correction. Get the origin calibration location. Function code = 9.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 9 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------------------------|----------|----------|
| 9 | Fixed point latitude degrees | Not used | Not used |

Example - get origin latitude (50.00 degrees):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 9 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 9 | 5000 | Not used | Not used |

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8.3.10 CAL_GEOGRAPHIC_LOCAL_SET

Geographic correction. Set the actual scale location. Function code = 10.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------------------|-------------|-------------|
| 10 | Fixed point latitude degrees | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 10 | Not used | Not used | Not used |

Example - set actual latitude to 50.00 degrees:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 10 | 5000 | Not used | Not used |

8.3.11 CAL_GEOGRAPHIC_LOCAL_GET

Geographic correction. Get the actual scale location. Function code = 11.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 11 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------------------------|----------|----------|
| 11 | Fixed point latitude degrees | Not used | Not used |

Example - get location latitude (50.00 degrees):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 11 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 11 | 5000 | Not used | Not used |

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8.4 Indicator functions

This chapter describes the indicator function codes.

8.4.1 IND_MAXLOAD_SET

Set the indicator maximum load. Function code = 101.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 101 | Max load | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 101 | Not used | Not used | Not used |

Example - set the maximum load to 10.020kg:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 101 | 10020 | Not used | Not used |

8.4.2 IND_MAXLOAD_GET

Get the indicator maximum load. Function code = 102.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 102 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 102 | Max load | Not used | Not used |

Example - get the maximum load (10.020kg):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 102 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 102 | 10020 | Not used | Not used |



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8.5 PDI functions

This chapter describes the PDO function codes.

8.5.1 PDI_PATH_SET

Set the PDI path to perform the action on. Function code = 201.

Request:

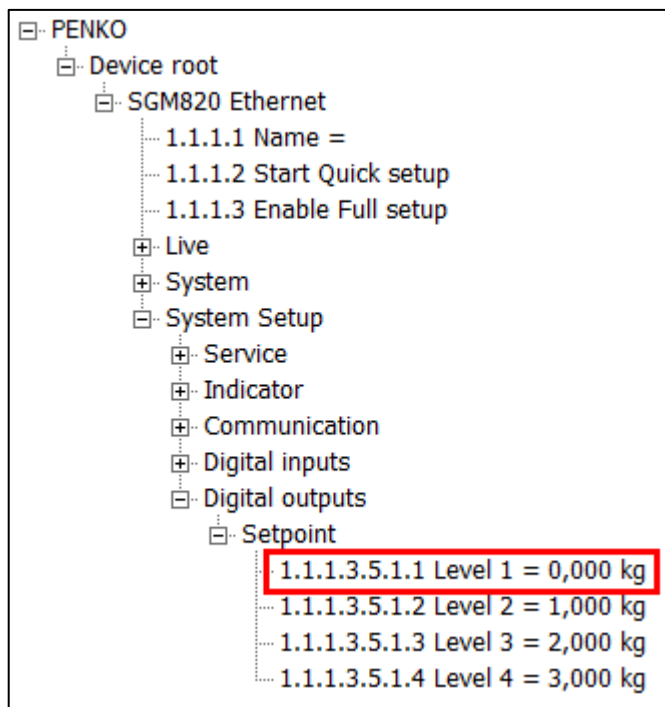
| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|------------------|------------------|---------------------|
| 201 | Path no. 1,2,3,4 | Path no. 5,6,7,8 | Path no. 9,10,11,12 |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------------|------------------|---------------------|
| 201 | Path no. 1,2,3,4 | Path no. 5,6,7,8 | Path no. 9,10,11,12 |

PDI (PENKO Device Interface) represents the device configuration in a tree structure. Every property has its own unique path number. The tree is used in the PENKO configuration tools Pi Mach II and PDI Client, both available at www.penko.com/software

For example, a part of the PENKO SGM820 looks like this:



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Setpoint 1 has path number 1.1.1.3.5.1.1. This results in the following input parameters:

Fill the path with zeros to make 12 numbers: 1.1.1.3.5.1.1.0.0.0.0.0

| | | |
|-------------|---------------------|----------|
| Parameter 1 | PDI_PATH_SET | 201 |
| Parameter 2 | 0x01 0x01 0x01 0x03 | 16843011 |
| Parameter 3 | 0x05 0x01 0x01 0x00 | 83951872 |
| Parameter 4 | 0x00 0x00 0x00 0x00 | 0 |

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 201 | 16843011 | 83951872 | 0 |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 201 | 16843011 | 83951872 | 0 |

The PDI path is now set.

If the path is not found, all zeros are returned.

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8.5.2 PDI_PROPERTY_SET

Set a PDI property for the selected PDI path. Function code = 202.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|----------------|-------------|-------------|
| 202 | Property value | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 202 | Not used | Not used | Not used |

Example - set setpoint 1 to 0.500kg (path must be selected with PDI_PATH_SET):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 202 | 500 | Not used | Not used |

8.5.3 PDI_PROPERTY_GET

Get a PDI property from the selected PDI path. Function code = 203.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 203 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|-------------------------------|--------------------------------|--------------------------------|
| 203 | Property value integer/string | Property value string optional | Property value string optional |

Example - get setpoint 1 (0.500kg) (path must be selected with PDI_PATH_SET):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 203 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 203 | 500 | Not used | Not used |

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Example - get the software version number (1.4.3.9.0.1) (path must be selected with PDI_PATH_SET):

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 203 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|-----------|-----------|-----------|
| 203 | 825111598 | 858667310 | 808333568 |

The result is a string containing the version number:

| | | | |
|----------|-----------|---------------------|------|
| Result 2 | 825111598 | 0x31 0x2E 0x34 0x2E | 1.4. |
| Result 3 | 858667310 | 0x33 0x2E 0x39 0x2E | 3.9. |
| Result 4 | 808333568 | 0x30 0x2E 0x31 0x00 | 0.1 |

1.4.3.9.0.1

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8.6 Printer functions

This chapter describes the printer function codes.

8.6.1 PRINT

Print ticket or line layout, depending on set layout in device. Function code = 301.

For the SGM series printing is only available at the SGM720/820 and SGM750/850.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 301 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------|------------|-------------|
| 301 | Gross weight | Net weight | Tare weight |

Example - print:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 301 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 301 | 699 | 620 | 79 |

Device printer layout setting: **ticket**

```
-----  
DATE                03-09-14  
TIME                11:02.51  
TICKET NUMBER:      42  
  
NET                 0,620 kg  
Tare                 0,079 kg  
                   ----- +  
GROSS                0,699 kg  
-----
```

Device printer layout setting: **line**

```
-----  
NR      (PRESET)TARE kg    NET kg  
75      0,079             0,620  
76      0,079             0,620  
77      0,079             0,620  
-----
```

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8.6.2 PRINT_SUBTOTAL

Print subtotal to printer. Function code = 302.

Not applicable for the SGM7xx/8xx series.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 302 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|-----------------------|---------------------|----------------------|
| 302 | Subtotal gross weight | Subtotal net weight | Subtotal tare weight |

Example - print subtotal:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 302 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 302 | 3078 | 2742 | 336 |

Printed ticket:

| | |
|----------------|----------|
| DATE | 03-09-14 |
| TIME | 13:53.25 |
| TICKET NUMBER: | 3 |
| SUBTOTAL NET | 2,742 kg |
| SUBTOTAL TARE | 0,336 kg |
| | ----- + |
| SUBTOTAL GROSS | 3,078 kg |

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8.6.3 PRINT_TOTAL

Print total to printer. Function code = 303.

For the SGM series printing is only available at the SGM720/820 (Ethernet) and SGM750/850 (serial).

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 303 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------------|------------------|-------------------|
| 303 | Total gross weight | Total net weight | Total tare weight |

Example - print total:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 303 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 303 | 7182 | 6398 | 784 |

Printed ticket:

| | |
|----------------|----------|
| DATE | 03-09-14 |
| TIME | 14:02.04 |
| TICKET NUMBER: | 7 |
| TOTAL NET | 6,398 kg |
| TOTAL TARE | 0,784 kg |
| | ----- + |
| TOTAL GROSS | 7,182 kg |

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8.6.4 PRINT_DAYTOTAL

Print day total to printer. Function code = 304.

Not applicable for the SGM7xx/8xx series.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 304 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------------------|----------------------|-----------------------|
| 304 | Day total gross weight | Day total net weight | Day total tare weight |

Example - print day total:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 304 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 304 | 3454 | 3118 | 336 |

Printed ticket:

| | |
|-----------------|----------|
| ----- | |
| DATE | 03-09-14 |
| TIME | 14:09.36 |
| TICKET NUMBER: | 3 |
| | |
| DAY TOTAL NET | 3,118 kg |
| DAY TOTAL TARE | 0,336 kg |
| | ----- + |
| DAY TOTAL GROSS | 3,454 kg |
| ----- | |

PENKO EtherNet/IP protocol

8.6.5 PRINT_BATCHTOTAL

Print batch total to printer. Function code = 305.

Not applicable for the SGM7xx/8xx series.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 305 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------------------|------------------------|-------------------------|
| 305 | Batch total gross weight | Batch total net weight | Batch total tare weight |

Example - print batch total:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 305 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 305 | 10636 | 9516 | 1120 |

Printed ticket:

| | |
|-------------------|-----------|
| DATE | 03-09-14 |
| TIME | 14:12.08 |
| TICKET NUMBER: | 10 |
| BATCH TOTAL NET | 9,516 kg |
| BATCH TOTAL TARE | 1,120 kg |
| | ----- + |
| BATCH TOTAL GROSS | 10,636 kg |

PENKO EtherNet/IP protocol

8.6.6 PRINT_LAYOUT

Print to Printer function custom layout 1-n. Function code = 306.

Not supported by 1020 and SGM series.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 306 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|-------------------|----------|----------|
| 306 | Layout number 1-n | Not used | Not used |

Example - print with custom layout:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 306 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 306 | 1 | Not used | Not used |

PENKO EtherNet/IP protocol

8.6.7 PRINT_ALIBI

Print to Alibi memory function. Store the actual stable weight in Alibi memory. Function code = 307.

For the SGM series Alibi memory is only available at the SGM8xx series.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 307 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|-----------|---------------|
| 307 | UID* | Gross/Net | Preset (Tare) |

* UID can exceed the maximum positive value of the LONG data type (signed). Use the DWORD data type (unsigned).

Example - write to Alibi memory, with active tare:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 307 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------|----------|----------|
| 307 | 1944985600 | 1315 | 112 |

Corresponding Alibi records:

| Entry | Code | Date/Value | Time/Unit | UID |
|-------------|-----------|--------------|-----------|-------------------|
| 00001/00004 | Alibi 001 | 03-09-14 | 15:00:46 | 1944985600 |
| 00002/00004 | Net | 1.315 | kg | 3803586561 |
| 00003/00004 | Tare | 0.112 | kg | 1269178371 |
| 00004/00004 | Gross | 1.427 | kg | 0718544901 |

Example - write to Alibi memory, without active tare:

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------|----------|----------|
| 307 | 1660428288 | 1711 | 0 |

Corresponding Alibi records:

| Entry | Code | Date/Value | Time/Unit | UID |
|-------------|-----------|--------------|-----------|-------------------|
| 00001/00002 | Alibi 001 | 03-09-14 | 15:02:34 | 1660428288 |
| 00002/00002 | Gross | 1.711 | kg | 1133518849 |

PENKO EtherNet/IP protocol

8.6.8 PRINT_ALIBIMEMORY

Print the complete Alibi memory to a printer. Function code = 308.

For the SGM series Alibi/printing is only available at the SGM820 and SGM850.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 308 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 308 | Not used | Not used | Not used |

Example - print the complete Alibi memory:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 308 | Not used | Not used | Not used |

Printed ticket:

```
Device: 1020
Serial Number FFFFFFFF
Date : 03-09-14   Time : 15:19:19
Alibi Memory
Number UID      Code      Date/Value      Time/Unit
  1 1660428288 Alibi 001      03-09-14      15:11:28
  2 1133518849 Gross      1.711         kg
  3 1941708803 Alibi 001      03-09-14      15:19:08
  4 3786547204 Net        1.162         kg
  5 3158056966 Tare       0.350         kg
  6 0510926856 Gross      1.512         kg
  7 1941708810 Alibi 001      03-09-14      15:19:08
  8 3786547211 Net        1.162         kg
  9 3158056973 Tare       0.350         kg
 10 0510926863 Gross      1.512         kg
```

PENKO EtherNet/IP protocol

8.6.9 PRINT_EVENTMEMORY

Print the complete Event log to a printer. Function code = 309.

For the SGM series Event/printing is only available at the SGM820 and SGM850.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 309 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 309 | Not used | Not used | Not used |

Example - print the complete Event log:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 309 | Not used | Not used | Not used |

Printer ticket:

```
Device: 1020
Serial Number FFFFFFFF
Date : 03-09-14   Time : 15:33:59
Event Log
Number UID      Code          Date/Value    Time/Unit
  1 0841613312 TAC Changed   30-06-14     11:43:48
  2 1371668481 Events Cleared 30-06-14     11:43:48
  3 1251344386 System Default 30-06-14     12:08:50
  4 1182662659 SoftwareUpdate 30-06-14     12:10:10
  5 4005953540 Alibi Cleared  30-06-14     13:50:20
  6 4005953541 Alibi Cleared  30-06-14     13:50:20
  7 2012479494 CAL Changed   30-06-14     13:58:34
  8 1503395847 CAL Changed   30-06-14     13:58:42
  9 4230086664 Alibi Cleared  30-06-14     14:29:58
 10 3949592585 SoftwareUpdate 31-07-14     09:11:28
```

PENKO EtherNet/IP protocol

8.7 Total functions

This chapter describes the total function codes.

8.7.1 TOTAL_TOTALIZE

Totalize actual stable weight. Function code = 401.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 401 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------------|------------------|-------------------|
| 401 | Added gross weight | Added net weight | Added tare weight |

Example - add actual stable weight to total:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 401 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 401 | 1512 | 1162 | 350 |

PENKO EtherNet/IP protocol

8.7.2 TOTAL_SUBTOTAL

Get the subtotal weights. Function code = 402.

Not applicable for the SGM7xx/8xx series.

Leave parameter 2 empty to read the subtotal weights.

Set parameter 2 to **0x55AA55AA** to reset the subtotal weights.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 402 | Optional | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|-----------------------|---------------------|----------------------|
| 402 | Subtotal gross weight | Subtotal net weight | Subtotal tare weight |

Example - read the subtotal weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 402 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 402 | 12096 | 9296 | 2800 |

Example - reset the subtotal weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 402 | 1437226410 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 402 | 12096 | 9296 | 2800 |

When reading again, all subtotal weights are 0.

PENKO EtherNet/IP protocol

8.7.3 TOTAL_TOTAL

Get the total weights. Function code = 403.

Leave parameter 2 empty to read the total weights.

Set parameter 2 to **0x55AA55AA** to reset the total weights.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 403 | Optional | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------------|------------------|-------------------|
| 403 | Total gross weight | Total net weight | Total tare weight |

Example - read the total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 403 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 403 | 12096 | 9296 | 2800 |

Example - reset the total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 403 | 1437226410 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 403 | 12096 | 9296 | 2800 |

When reading again, all total weights are 0.

PENKO EtherNet/IP protocol

8.7.4 TOTAL_DAYTOTAL

Get the day total weights. Function code = 404.

Not applicable for the SGM7xx/8xx series.

Leave parameter 2 empty to read the day total weights.

Set parameter 2 to **0x55AA55AA** to reset the day total weights.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 404 | Optional | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|------------------------|----------------------|-----------------------|
| 404 | Day total gross weight | Day total net weight | Day total tare weight |

Example - read the day total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 404 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 404 | 12096 | 9296 | 2800 |

Example - reset the day total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 404 | 1437226410 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 404 | 12096 | 9296 | 2800 |

When reading again, all day total weights are 0.

PENKO EtherNet/IP protocol

8.7.5 TOTAL_BATCHTOTAL

Get the batch total weights. Function code = 405.

Not applicable for the SGM7xx/8xx series.

Leave parameter 2 empty to read the batch total weights.

Set parameter 2 to **0x55AA55AA** to reset the batch total weights.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 405 | Optional | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------------------|------------------------|-------------------------|
| 405 | Batch total gross weight | Batch total net weight | Batch total tare weight |

Example - read the batch total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 405 | Not used | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 405 | 12096 | 9296 | 2800 |

Example - reset the batch total weights:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 405 | 1437226410 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 405 | 12096 | 9296 | 2800 |

When reading again, all batch total weights are 0.

PENKO EtherNet/IP protocol

8.8 Controller functions

This chapter describes the controller functions for the belt weigher, check weigher and mono filler.

8.8.1 RFN_PROCESS_RECIPE_GET

Get the value of the selected recipe parameter. Function code = 501.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|--------------|-------------|-------------|
| 501 | Recipe param | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------|----------|----------|
| 501 | Recipe param | Value | Not used |

Example - get the value of recipe parameter 1:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 501 | 1 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 501 | 1 | 2000 | Not used |

8.8.2 RFN_PROCESS_RECIPE_SET

Set the value of the selected recipe parameter. Function code = 502.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|--------------|-------------|-------------|
| 502 | Recipe param | Value | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------|----------|----------|
| 502 | Recipe param | Not used | Not used |

Example - set the value of recipe parameter 2 to 500:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 502 | 2 | 500 | Not used |



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8.8.3 RFN_PROCESS_CONFIG_GET

Get the value of the selected configuration parameter. Function code = 601.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|--------------|-------------|-------------|
| 601 | Config param | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------|----------|----------|
| 601 | Config param | Value | Not used |

Example - get the value of configuration parameter 1:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 601 | 1 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 601 | 1 | 2000 | Not used |

8.8.4 RFN_PROCESS_CONFIG_SET

Set the value of the selected configuration parameter. Function code = 602.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|--------------|-------------|-------------|
| 602 | Config param | Value | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|--------------|----------|----------|
| 602 | Config param | Not used | Not used |

Example - set the value of configuration parameter 2 to 500:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 602 | 2 | 500 | Not used |

PENKO EtherNet/IP protocol

8.8.5 RFN_PROCESS_DATA

Get the value of the selected process data parameter. Function code = 701.

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|---------------|-------------|-------------|
| 701 | Process param | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|---------------|----------|----------|
| 701 | Process param | Value | Not used |

Example - get the value of process parameter 1:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|-------------|-------------|-------------|-------------|
| 701 | 1 | Not used | Not used |

Reply:

| Result 1 | Result 2 | Result 3 | Result 4 |
|----------|----------|----------|----------|
| 701 | 1 | 2000 | Not used |

PENKO EtherNet/IP protocol

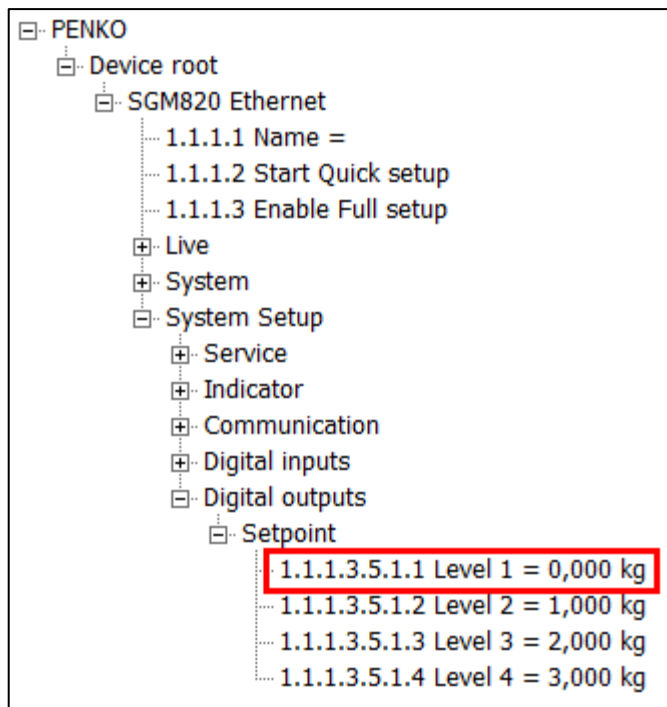
9 Examples

These examples are made with the ODVA EtherNet/IP™ Protocol Conformance Test.

9.1 Class 0x01 execute PDI

PDI (PENKO Device Interface) represents the device configuration in a tree structure. Every property has its own unique path number. The tree is used in the PENKO configuration tools Pi Mach II and PDI Client, both available at www.penko.com/software

For example, a part of the PENKO SGM820 looks like this:



Consult the PENKO PDI documentation for more information, available at www.penko.com

The PDI request exists out of the PDI command, a PDI function and a path. The command is a fixed value; 0xB4. The PDI functions are shown in the following table. The path indicates the parameter.

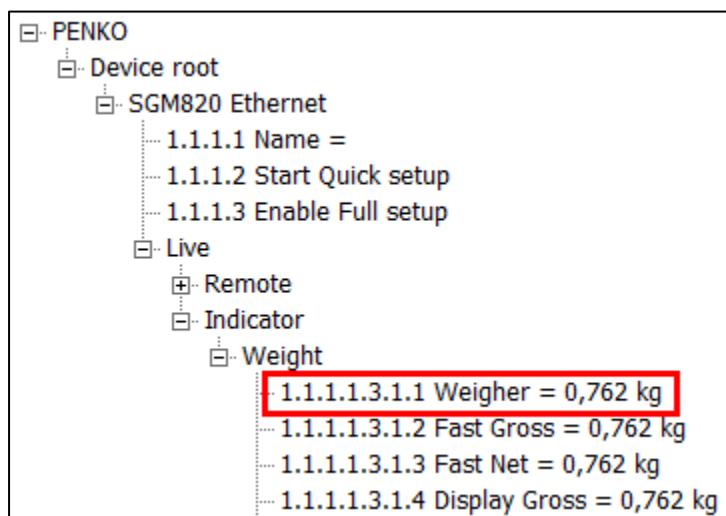
The PDI reply exists out of the full request and the result.

PENKO EtherNet/IP protocol

| PDI function | Description |
|----------------------|--------------------------------|
| 0x00 PDI_AVAIL | Function available |
| 0x01 PDI_ENUMERATE | Enumerate structure |
| 0x02 PDI_PROPERTY | Property structure |
| 0x03 PDI_GET | Value read |
| 0x04 PDI_SET | Value write |
| 0x05 PDI_SETANDREPLY | Value write and get reply code |

Read weigher value

The weigher value is found at PDI path 1.1.1.1.3.1.1



The used PDI function is PDI_GET

Request:

| Command | Function | Path |
|---------|----------|------------------------|
| 0xB4 | 0x03 | 0x01 01 01 01 03 01 01 |

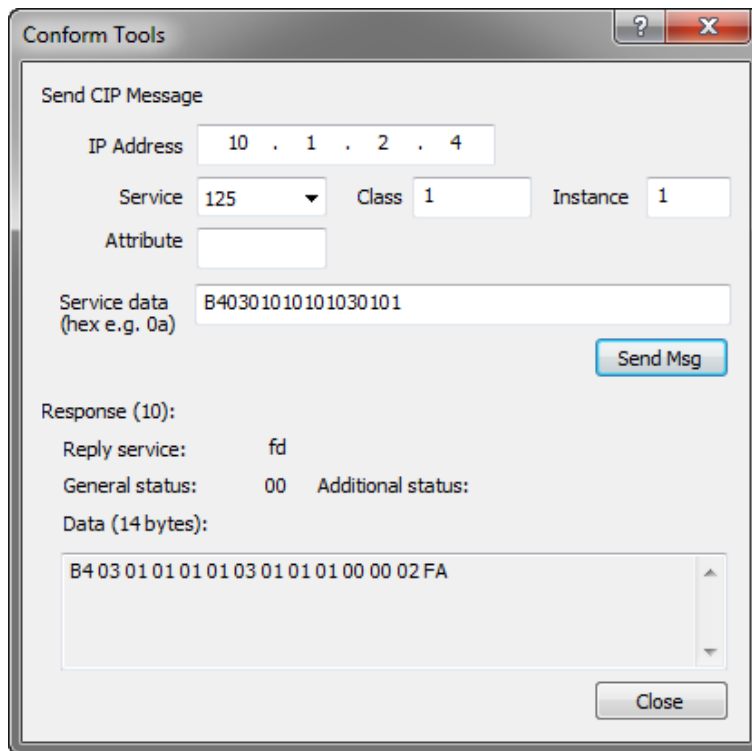
Reply:

| Command | Function | Path | Status | Property value |
|---------|----------|------------------------|--------|----------------|
| 0xB4 | 0x03 | 0x01 01 01 01 03 01 01 | 0x01 | 0x00 00 02 FA |

- Status 0x01 is OK
- The weight is 0x00 00 02 FA → 762

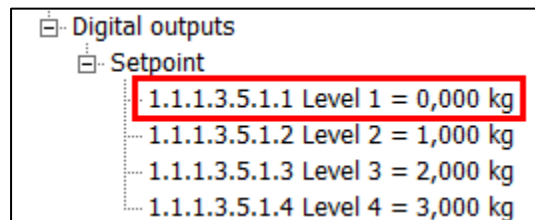
PENKO EtherNet/IP protocol

With test tool:



Write setpoint 1

Setpoint 1 is found at PDI path 1.1.1.3.5.1.1



The used PDI function is PDI_SET

A null terminator is added to separate the path and the value.

To set this setpoint to 300, the following request is sent:

| Command | Function | Path | Terminator | Property value |
|---------|----------|------------------------|------------|----------------|
| 0xB4 | 0x04 | 0x01 01 01 03 05 01 01 | 0x00 | 0x00 00 01 2C |

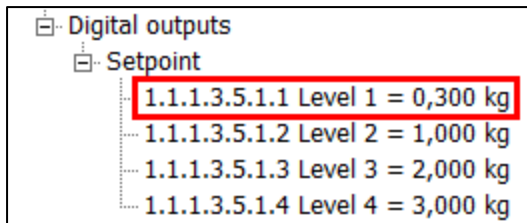
PENKO EtherNet/IP protocol

The reply will be as follows:

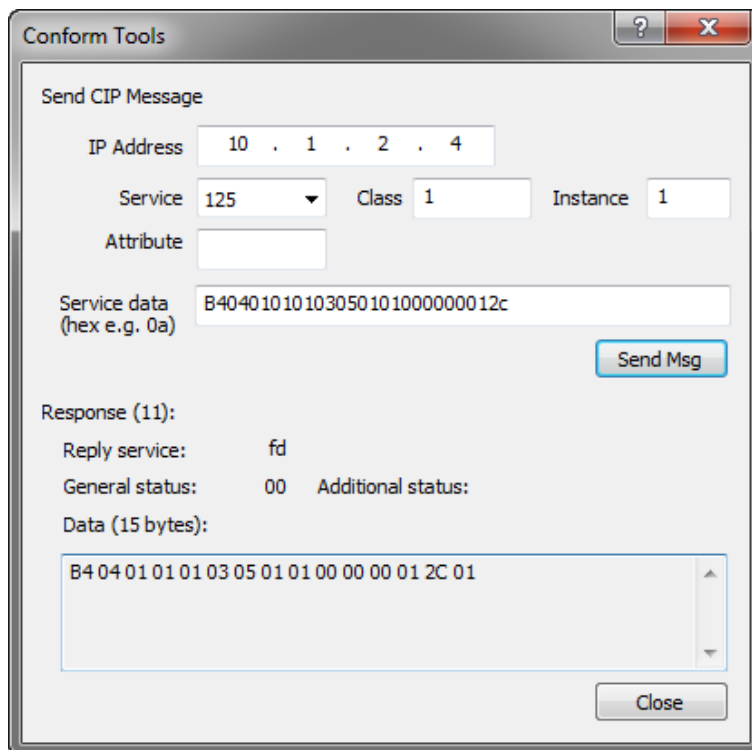
| Command | Function | Path | Terminator | Property value | Save OK |
|---------|----------|------------------------|------------|----------------|---------|
| 0xB4 | 0x04 | 0x01 01 01 03 05 01 01 | 0x00 | 0x00 00 01 2C | 0x01 |

- The set value is 0x00 00 01 2C → decimal 300
- Save OK 0x01 is succeeded

Changed value:



With test tool:



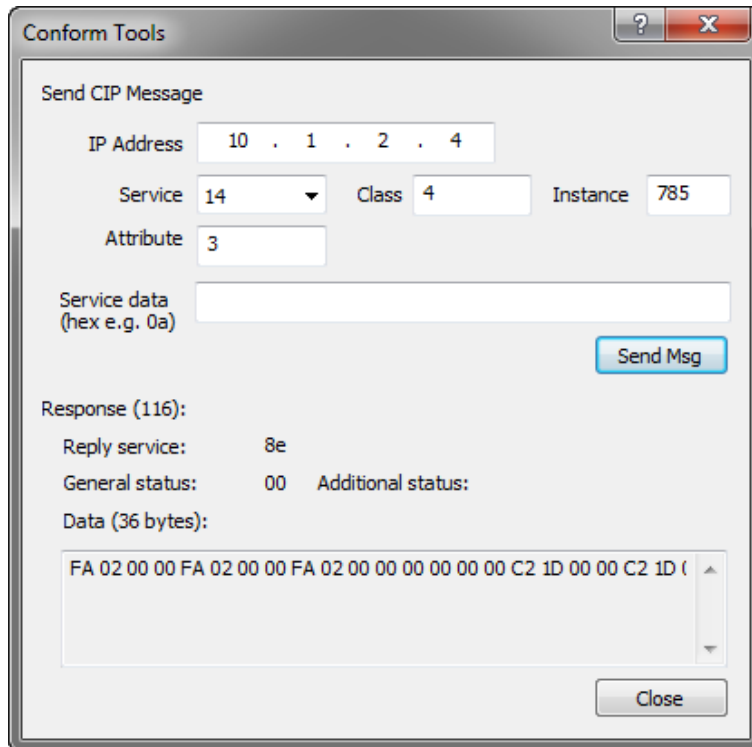
PENKO EtherNet/IP protocol

9.2 Class 0x04 read/write weigher data

The assembly class contains several instances to read or write weigher data. The used attribute number for all instances is 3.

Get weigher data

Instance 785 holds a list of weigher data.



The following data is returned. Mind the byte order within every DINT and WORD.

| Data | Data type | Value HEX | Value |
|------------|-----------|-------------|--------------------------|
| WEIGHER | DINT | 00 00 02 FA | 762 |
| GROSS | DINT | 00 00 02 FA | 762 |
| NET | DINT | 00 00 02 FA | 762 |
| TARE | DINT | 00 00 00 00 | 0 |
| WEIGHERx10 | DINT | 00 00 1D C2 | 7618 |
| GROSSx10 | DINT | 00 00 1D C2 | 7618 |
| NETx10 | DINT | 00 00 1D C2 | 7618 |
| TAREx10 | DINT | 00 00 00 00 | 0 |
| FORMAT | WORD | C0 03 | Bit# 0, 1, 14 and 15* |
| STATUS | WORD | 20 CC | Bit# 2, 3, 6, 7 and 13** |

* Decimal point position = 3, display step-size = 1, zero-suppressing = true, signed = true

** Stable = true, stable range = true, zero range = true, zero track = true, industrial = true

PENKO EtherNet/IP protocol

Control weigher

Instance 872 controls the device.

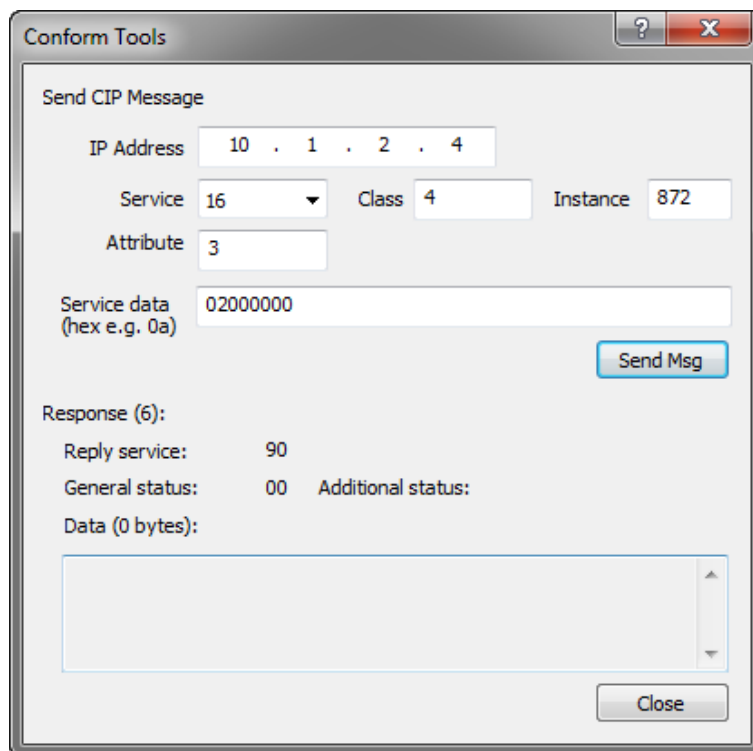
Request:

| Control WORD | Reserved WORD |
|--------------|---------------|
| 0x00 00* | 0x00 00 |

* Mind the byte order within the WORD

Set zero is control bit# 1, 0x00 02

| Control WORD | Reserved WORD |
|--------------|---------------|
| 0x02 00 | 0x00 00 |



Reset zero is control bit# 0, 0x00 01

| Control WORD | Reserved WORD |
|--------------|---------------|
| 0x01 00 | 0x00 00 |

Set tare is control bit# 3, 0x00 08

| Control WORD | Reserved WORD |
|--------------|---------------|
| 0x08 00 | 0x00 00 |

Reset tare is control bit# 2, 0x00 04

| Control WORD | Reserved WORD |
|--------------|---------------|
| 0x04 00 | 0x00 00 |

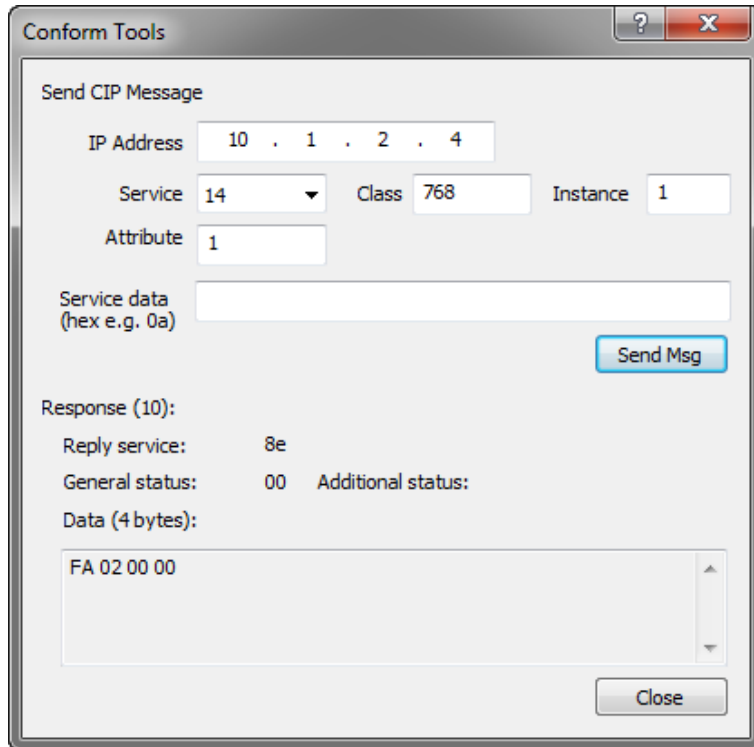
PENKO EtherNet/IP protocol

9.3 Class 0x300 read/write weigher data

The weigher class is a custom PENKO class used to read/write weigher data.

Get weigher value

Instance attribute 1 holds the weigher value. Instance service 14 reads a single instance attribute.



The reply 0x00 00 02 FA → 762

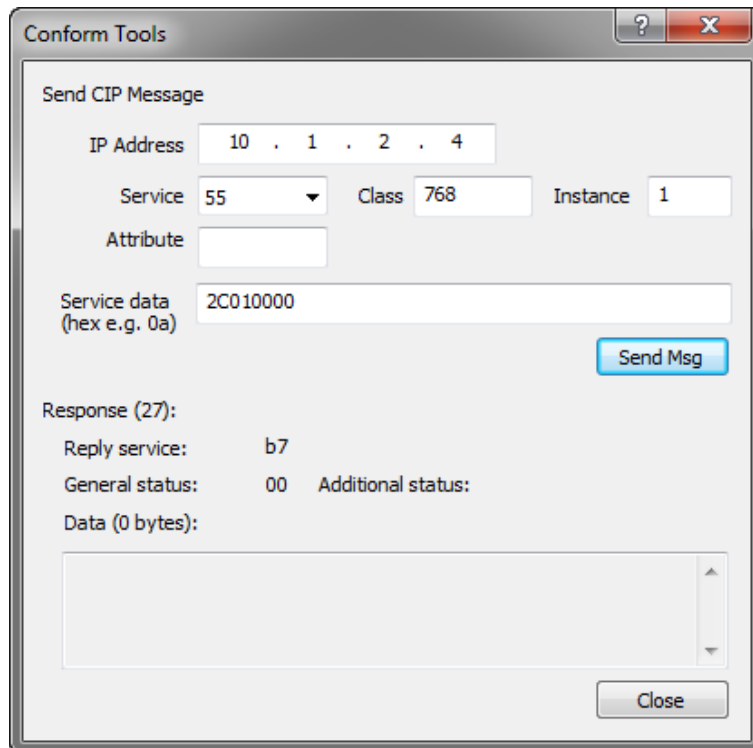
PENKO EtherNet/IP protocol

Set the preset tare

Instance service 55 sets the preset tare value.

Enter the value as parameter. Data type is DINT.

Set the preset tare to 300 → 00 00 01 2C

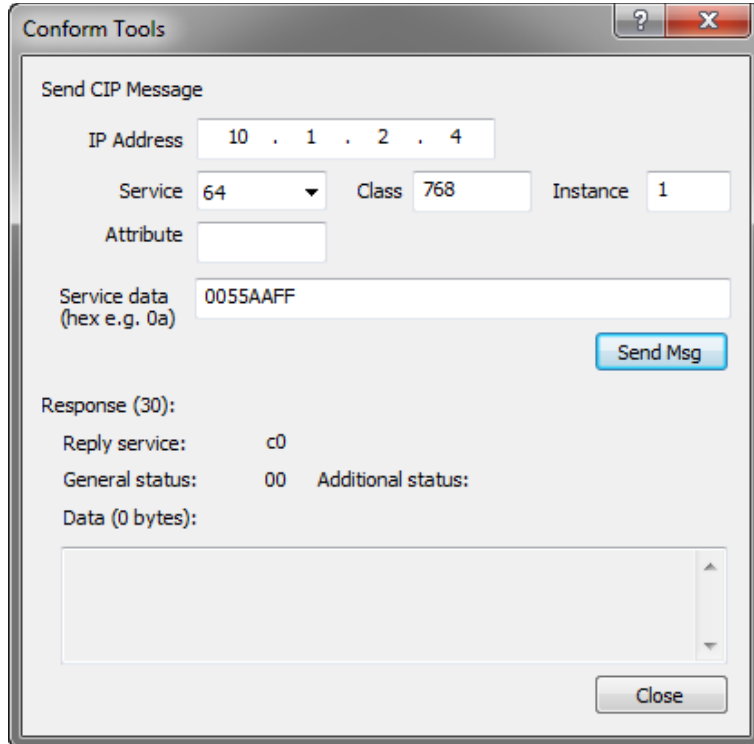


The screenshot shows a software window titled "Conform Tools" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there is a section titled "Send CIP Message". Below this title, there are several input fields: "IP Address" with the value "10 . 1 . 2 . 4", "Service" with a dropdown menu showing "55", "Class" with the value "768", and "Instance" with the value "1". There is also an empty "Attribute" field. Below these fields is a "Service data (hex e.g. 0a)" field containing the value "2C010000". To the right of this field is a blue "Send Msg" button. Below the "Send CIP Message" section, there is a "Response (27):" section. It contains three lines of text: "Reply service: b7", "General status: 00 Additional status:", and "Data (0 bytes):". Below this text is a large, empty rectangular area with a vertical scrollbar on the right side, intended for displaying the response data. At the bottom right of the window is a "Close" button.

PENKO EtherNet/IP protocol

Calibrate zero

Instance service 64 calibrates the zero point. For calibration actions a security code is needed. This is FFAA5500.



The screenshot shows a window titled "Conform Tools" with a standard Windows-style title bar (minimize, maximize, close buttons). The window contains the following fields and controls:

- Send CIP Message** section:
 - IP Address:** 10 . 1 . 2 . 4
 - Service:** 64 (dropdown menu)
 - Class:** 768
 - Instance:** 1
 - Attribute:** (empty text box)
 - Service data (hex e.g. 0a):** 0055A AFF
 - Send Msg:** (blue button)
- Response (30):** section:
 - Reply service:** c0
 - General status:** 00 **Additional status:** (empty)
 - Data (0 bytes):** (empty text area)
- Close:** (grey button)

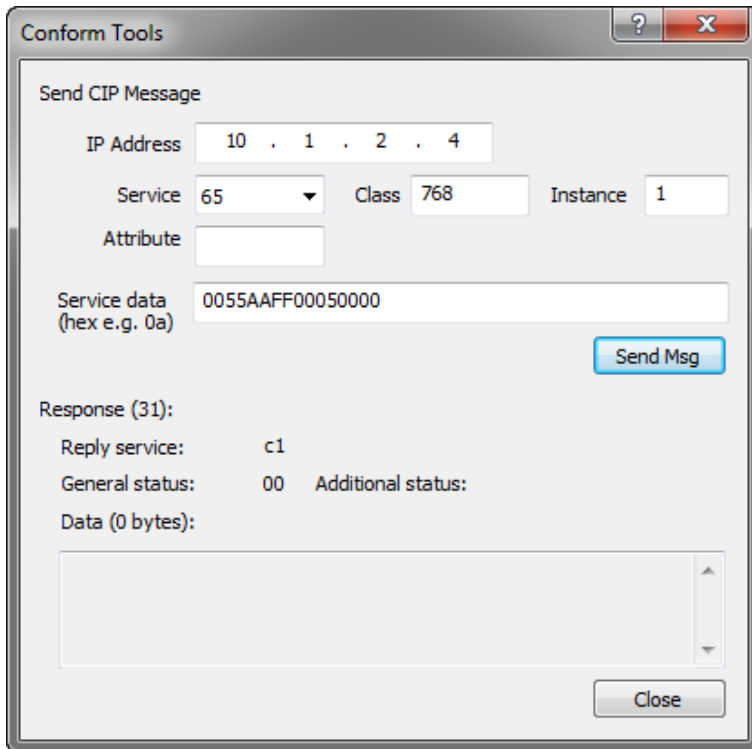
PENKO EtherNet/IP protocol

Calibrate span

Instance service 65 calibrates the span point. For calibration actions a security code is needed. This is FFAA5500.

Place the span weight after the security code.

Calibrate span at 1280 → 00 00 05 00



The screenshot shows a window titled "Conform Tools" with a "Send CIP Message" dialog box. The dialog box contains the following fields and controls:

- IP Address:** 10 . 1 . 2 . 4
- Service:** 65 (dropdown menu)
- Class:** 768
- Instance:** 1
- Attribute:** (empty text box)
- Service data (hex e.g. 0a):** 0055AAFF00050000
- Send Msg:** (blue button)
- Response (31):**
 - Reply service: c1
 - General status: 00 Additional status:
 - Data (0 bytes): (empty text box)
- Close:** (grey button)

PENKO EtherNet/IP protocol

Use register function

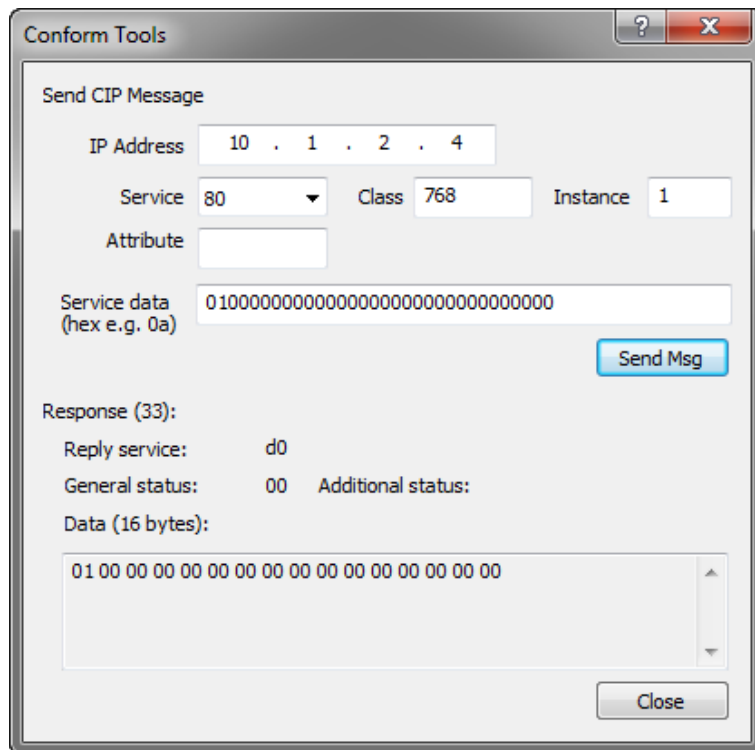
Instance service 80 executes the register functions. Enter the input values as parameter.

Each input value has to be entered as DINT[4]. Not used parameter has to be entered as 0.

Calibrating the zero point is function code 1. The input values are:

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---------------|---------------|---------------|---------------|
| 0x00 00 00 01 | 0x00 00 00 00 | 0x00 00 00 00 | 0x00 00 00 00 |



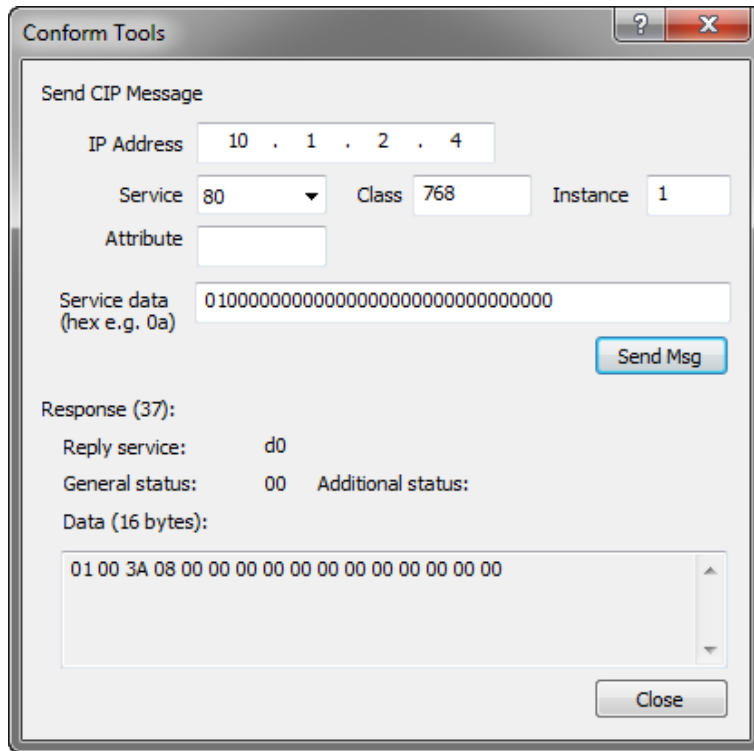
The reply shows the function code.

Reply:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---------------|---------------|---------------|---------------|
| 0x00 00 00 01 | 0x00 00 00 00 | 0x00 00 00 00 | 0x00 00 00 00 |

PENKO EtherNet/IP protocol

In case an error occurs, the error code is passed in the reply.



Reply:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---------------|---------------|---------------|---------------|
| 0x08 3A 00 01 | 0x00 00 00 00 | 0x00 00 00 00 | 0x00 00 00 00 |

Error code = 0x083A = 2106 = A/D reads all 1's, Hardware Overload on loadcell

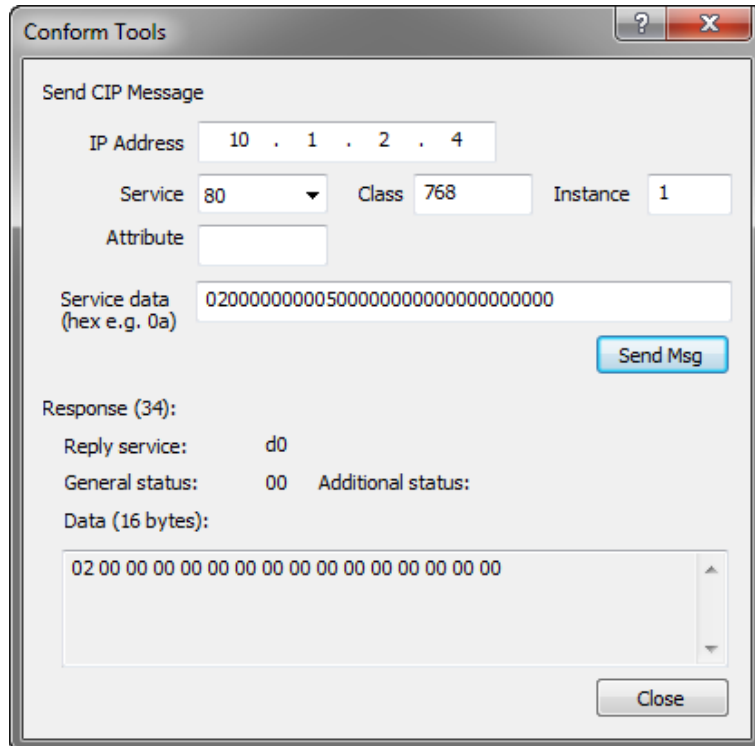
PENKO EtherNet/IP protocol

Calibrating the gain point is function code 2. Parameter 2 is used to enter the weight.

Calibrate span at 1280 → 00 00 05 00

Request:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---------------|---------------|---------------|---------------|
| 0x00 00 00 02 | 0x00 00 05 00 | 0x00 00 00 00 | 0x00 00 00 00 |



The reply shows the function code.

Reply:

| Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---------------|---------------|---------------|---------------|
| 0x00 00 00 02 | 0x00 00 00 00 | 0x00 00 00 00 | 0x00 00 00 00 |



About PENKO

At PENKO Engineering we specialize in weighing. Weighing is inherently chemically correct, independent of consistency, type or temperature of the raw material. This means that weighing any kind of material guarantees consistency and thus, it is essential to sustainable revenue generation in any industry. As a well-established and proven solution provider, we strive for the ultimate satisfaction of custom design and/or standard applications, increasing your efficiencies and saving you time, saving you money.

Whether we are weighing raw materials, components in batching, ingredients for mixing or dosing processes, - or weighing of static containers and silos, or - in-motion weighing of railway wagons or trucks, by whatever means required during a process, we are essentially forming vital linkages between processes and businesses, anywhere at any time. We design, develop and manufacture state of the art technologically advanced systems in accordance with your strategy and vision. From the initial design brief, we take a fresh approach and a holistic view of every project, managing, supporting and/or implementing your system every step of the way. Curious to know how we do it? www.penko.com

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PENKO sets high standards for its products and product performance which are tested, certified and approved by independent expert and government organizations to ensure they meet – and even – exceed metrology industry guidelines. A library of testing certificates is available for reference on:

http://penko.com/nl/publications_certificates.html

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PENKO is committed to ensuring every system is installed, tested, programmed, commissioned and operational to client specifications. Our engineers, at our weighing center in Ede, Netherlands, as well as our distributors around the world, strive to solve most weighing-system issues within the same day. On a monthly basis PENKO offers free training classes to anyone interested in exploring modern, high-speed weighing instruments and solutions. Training sessions on request: www.penko.com/training



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