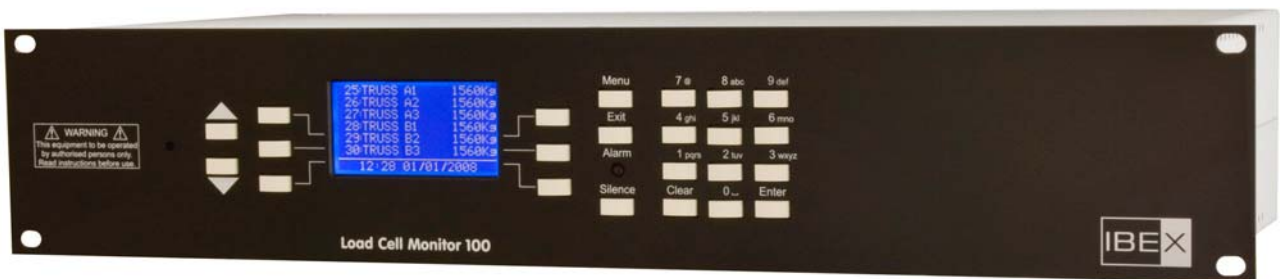


LOAD CELL MONITOR 100

USER MANUAL



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Revision: 1.04
Author: Adam Pulley
Date: 25/08/09

IMPORTANT SAFETY INFORMATION

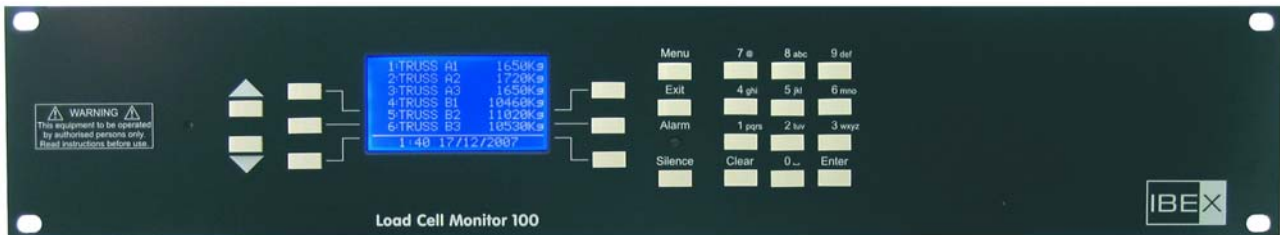
The Load Cell Monitor 100 is a sophisticated load sensing solution that has been designed with safety as a primary concern. However, as with any load monitoring system it is the end users responsibility to carry out a full risk assessment of their application. You must ensure that the monitoring system used is suitable for your application and is used in the correct manner.

- Always carry out a full risk assessment of your application.
- Always ensure that all relevant sections of this manual have been read and fully understood before operating the Load Cell Monitor 100.
- Always check any load cells connected to the Load Cell Monitor 100 are properly maintained according to your risk assessment and the manufacturer's instructions.
- Only allow suitably trained persons to operate the Load Cell Monitor 100
- The Load Cell Monitor 100 is for use by professionals only.

Safety should be your prime concern. If in any doubt seek professional advice.

INTRODUCTION

The Load Cell Monitor 100 is fully featured digital load cell monitoring system, combining powerful setup and reporting features with ease of use. Using fully embedded processors for ultimate reliability the Load Cell Monitor 100 constantly reads the live weight from each connected load cell. As well as displaying the weights on its front panel LCD screen, and optionally via a PC full screen display, it also compares the individual weights to user defined maximum weights. Should any load cell exceed its maximum weight setting an alarm is immediately triggered and a log of the overload event is stored. In addition to the front panel sounder and indicator, a relay output provides alarm condition signalling to an external system or high volume sounder.



FEATURES

The Load Cell Monitor 100 provides the following powerful features:

- Monitoring of up to 100 digital load cells
- Log history of alarm events and automatic daily weight readings
- Load cells are connected in a 'daisy chain' fashion using a single 4 core cable, with up to 25 load cells per cable
- Opto isolated data connections on each output port
- Built in power supply provides low voltage power to the load cells
- Live load cell weight display on the front panel LCD screen
- Each load cell may be assigned a maximum weight with audible and visual alarm should a maximum weight be exceeded
- Two volt free relay outputs to provide external alarm signalling
- Optional password protection to stop unauthorised users altering settings
- Fully embedded processor design - no reliance on PC technology or operating systems
- Optional full screen weights display using a PC connected to the Ethernet port. One or more PC's running the IBEX Hoist-Net PC application may be used to view all channels at once, with user configurable screen layout.

The Load Cell Monitor 100 Plus model provides these additional features:

- Automatic alarm event notification via the internet to a user defined email address
- Automatic periodic sending of the log history over the internet via email
- Remote request for live weights and log data over the internet via email

CONNECTIONS



POWER

Power is provided via an IEC plug.

Mains input voltage 85 – 260VAC 50/60Hz

Operating current Up to 1.65A (10A or higher type C circuit breaker recommended for brief power on surge current)

This product must be earthed.

LOAD CELLS

This product is designed to be used with load cells that incorporate the Mantracourt DCell RS485 ASCII load cell amplifier. This is an industry standard miniature OEM amplifier module widely used by load cell manufacturers. Each load cell should incorporate a 4 pin 'in' and a 4 pin 'out' connection.

Note that Load Cell Monitor 100 will automatically set the baud rate of the load cells on power-up to 4 (38K4), if the load cells have previously been set to baud rate 7 (115K2), 6 (76K8), 5 (57K6), 3 (19K2) or 2 (9K6).

Four 4 pin XLR sockets are provided:

Pin	Connection	Cable
1	0V	Pair 1-A + Screen
2	Data-	Pair 2-A
3	Data+	Pair 2-B
4	+12V	Pair 1-B

Each socket provides 12VDC max 1.6A (protected by internal self resetting electronic fuse).

Each Load Cell connection may have up to 25 load cells connected. The connections are named Port 1 to Port 4.

Cable requirements

A 2 twisted pairs cable suitable for RS485 data should be used with an overall screen

All connected cabling must be rated at a minimum of 1.6A.

If long cable runs are used a cable with sufficient gauge should be used to avoid voltage drop (e.g. 22AWG or 20AWG (note that AWG core sizes work in reverse – e.g. 20AWG is bigger than 22AWG)).

The load cells must be connected in daisy chain format, with a terminating resistor plug fitted at the end of the chain (120ohm resistor wired between pins 2 and 3). 'Y' splits in the cable run are not permitted.

Load Cell Setup Socket

This connection may be used to detect and program the RS485 network node address of a single connected load cell.

ALARM

A 5 pin XLR socket is provided for external alarm signalling:

Pin	Connection
1	Common
2	Alarm 1
3	Alarm 2
4	+12V
5	0V

Each of the alarm outputs is a normally open volt free relay contact rated at 500mA 24V DC/AC. When an alarm is active the relay contact closes.

The +12VDC output may be used to power external devices if required. Maximum current 900mA (protected by an internal self resetting electronic fuse).

Alarm 1

Load Cell Overload.

Remains active while any load cell weight is higher than its configured maximum weight. This signal is cleared if the Alarm is silenced using the front panel Silence button.

Alarm 2

Load Cell Error.

Remains active while any channel that is configured to read a load cell does not receive a response from the load cell. This signal is cleared if the Alarm is silenced using the front panel Silence button.

The two alarm signals may be commoned together if a single external alarm is required.

Monitoring Active

If an indication of the unit being powered and the load cells therefore being monitored is required then the +12V output may be used. Connect to an external indicator to confirm the unit is operating, or to an external relay to provide an external alarm should the unit not have power.

Alarm Activation

To avoid false alarms from brief overloads (due to say hoists starting and stopping) an alarm condition is only triggered after two successive overload readings.

ETHERNET

The 10Base-T Ethernet port allows the unit to be connected to a standard Ethernet network, or directly to a PC Ethernet port.

OPERATION

STATUS SCREEN

1: Truss A-1	1640Kg
2: Truss A-2	1640Kg
3: Truss A-3	1640Kg
4: Truss B-1	1640Kg
5: Truss B-2	1640Kg
6: Truss B-3	1640Kg
14:10 01/01/2008	

The main status screen displays the current weight of each of the 100 channels. This is the default screen.

Use the up and down buttons or numeric keypad to select channel numbers to view.

The current time and date are shown at the bottom of the screen.

LOAD CELL ALARM

Overload Alarm

LOAD CELL ALARM	
Chan 4 Truss B-1	
---OVERLOAD ALARM---	
Alarm Weight:	2060Kg
Weight Now:	2150Kg
Max Weight:	2000Kg

The Load Cell Monitor constantly compares the received weight of each load cell with the user configurable maximum weight. Should a load cell return a reading above the maximum weight on two successive reads (to avoid nuisance tripping caused by brief shock loads) the overload alarm is triggered. The internal sounder activates, alarm output 1 is activated and the Alarm indicator flashes.

The channel that has overloaded is displayed together with its name if it has one. The following status information is shown:

Alarm Weight	The weight reading that initially caused the alarm
Weight Now	The current weight of the load cell
Max Weight	The user set maximum weight

No Response Alarm

LOAD CELL ALARM	
Chan 4 Truss B-1	
--NO RESPONSE ALARM--	
Load Cell is now:	Not responding

Should the Load Cell Monitor 100 be unable to read the weight from a load cell on two successive attempts a no response alarm is triggered. The internal sounder activates, alarm output 2 is activated and the Alarm indicator flashes.

The channel that is not responding is displayed together with its name if it has one. The current status of the load cell is also shown.

Alarms General

The Silence button may be pressed to stop the internal sounder and external alarm output. The silence function will remain active for 5 seconds after an alarm condition clears, in case the alarm quickly re-occurs (for instance if a load cell weight is changing across the maximum weight value)

If an alarm condition clears (the load cell weight falls below the maximum or the load cell starts responding again) the internal sounder and alarm output are automatically reset but the alarm screen will continue to be shown until the Exit button is pressed, ensuring that a user see's the alarm event, unless a new alarm condition occurs on another channel which will cause the new alarm condition to be shown instead.

When either of the alarm screens are shown the menu functions are accessible as normal using the Menu button. To hide the shown alarm screen and view the general status screen press the Silence button a second time.

MAIN MENU

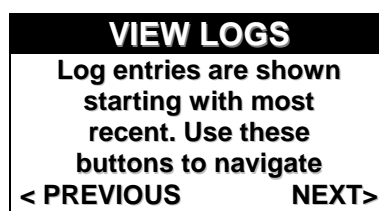
Pressing the Menu button enters the main menu.



Select the sub menu to enter, or press exit.

Note that pressing the Menu button whilst in a menu allows you to exit straight back to the default status screen.

VIEW LOGS



The Load Cell Monitor will create a new log entry for the following events:-

Power-up	Informs you if the unit lost power and the time and date power returned
When the clock is set	Informs you when the time or date was changed
Every day at 4am	An automatic log occurs at 4am every day
Alarm event	A log is stored when an alarm event occurs. Note that only a single log is stored for each alarm event, to avoid multiple successive logs from different channels while the original channel still has an alarm. The log is stored after a short delay, to ensure the status of all channels has been updated before storing.

Channel 3 Overload	
13:31 01/01/2008	
3: Truss A-3	2160Kg
4: Truss B-1	1640Kg
5: Truss B-2	1640Kg
6: Truss B-3	1640Kg
7:	Unused

The log entries are shown starting with the most recent. Use the bottom 2 screen buttons to navigate through the log entries. The right hand button moves to the next older log entry, the left hand button moves to the next newer entry. The screen will not refresh once you reach the last entry available.

The top line of the screen shows the cause of the log entry.

The next line shows the time and date of the log entry.

The remaining lines show the weight at the time of the log entry of all the channels. Use the up and down buttons, or numeric keypad, to select the channels to view.

If a channel was not configured with a load cell at the time of the log entry then 'Unused' is displayed (this is regardless of whether the channel is now configured with a load cell).

Note that the name shown for each channel is the name currently set for that channel.

The Load Cell Monitor stores up to 200 log entries, and will overwrite old entries if necessary as new entries are created.

UTILITIES MENU

UTILITIES MENU	
< View Channel Setup	
< View Max Weights	
< Test Alarm	View PHC>

View Channel Setup

Displays the setup of each channel as a list.

View Max Weights

Displays the user set maximum weight of each channel as a list

Test Alarm

Allows each of the alarm outputs to be simulated

View PHC

Only shown if the Load Cell Monitor has been setup to send load cell channels to an IBEX Programmable Hoist controller using port 4.

Displays the PHC load cell channels as a list

VIEW CHANNEL SETUP

Chan	Port	ID
2: Truss A-2	1	58
3: Truss A-3	2	687
4: Truss B-1	2	10
5: Truss B-2	3	95
6: Truss B-3	4	64
7:	Unused	

Each channel is shown together with its name if it has one. To the right the port number (1-4) that the channel is setup to use is shown followed by the load cell ID number.

The port is the XLR4 socket that the Load Cell Monitor 100 will use to communicate with the load cell. The ID is the load cell's unique ID number that the Load Cell Monitor 100 will send when trying to read the weight from the load cell.

'Unused' is displayed for channels that have not been setup to use a load cell.

Use the up and down buttons or numeric keypad to select channel numbers to view.

VIEW MAX WEIGHTS

Chan	Max Weight
2: Truss A-2	2000Kg
3: Truss A-3	2000Kg
4: Truss B-1	None
5: Truss B-2	None
6: Truss B-3	None
7:	Unused

Each channel is shown together with its name if it has one. To the right the user set maximum weight is shown.

'None' is displayed for channels that have not been setup with a maximum weight.

'Unused' is displayed for channels that have not been setup to use a load cell.

Use the up and down buttons or numeric keypad to select channel numbers to view.

TEST ALARM

TEST ALARM
< Alarm Output 1 Off
< Alarm Output 2 On
< Internal Alarm Off

Press each of the 3 buttons to turn on or off the associated alarm output.

The alarm outputs will be reset when exiting from this function.

VIEW PHC

PHC ID	Our Channel
1:	50
2:	51
3:	52
4:	Disabled
5:	Disabled
6:	Disabled

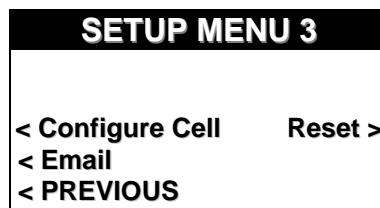
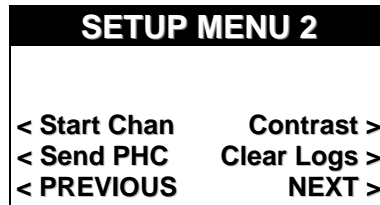
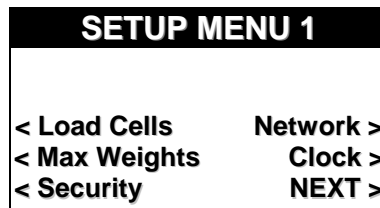
This function is only available if the Load Cell Monitor has been setup to send load cell channels to an IBEX Programmable Hoist controller using port 4.

Each PHC load cell ID is shown together with the Load Cell Monitor 100 channel that is configured to be sent to that PHC load cell ID. 'Disabled' is displayed for PHC load cell ID channels that have not been configured with a load cell channel.

Use the up and down buttons or numeric keypad to select channel numbers to view.

The sending of load cell channels to a Programmable Hoist controller works on the following basis. The Programmable Hoist Controller load cell port is connected to port 4 of the Load Cell Monitor 100. The Load Cell Monitor will change its operation of port 4 so that instead of reading load cells it waits to receive load cell requests from the Programmable Hoist controller. If a request is received for a PHC load cell ID that is configured to send a load cell channel then the Load Cell Monitor 100 responds with the current weight of that load cell channel. Operation is completely normal for both the Load Cell monitor 100 and the Programmable Hoist controller, except that the Load Cell Monitor 100 cannot use port 4 to read load cells as normal and is therefore only capable of reading up to 75 load cells connected to the other 3 ports. Each of the channels that is configured to be sent to the PHC is still displayed and monitored as normal by the Load Cell Monitor 100.

SETUP MENU



The setup menu is displayed across 3 screens. Use the NEXT and PREVIOUS buttons to select between them.

Load Cells

Setup the load cell channels

Max Weights

Setup the maximum weights of each load cell channel

Security

Setup a PIN code to restrict access to the setup menu

Network

Setup the Ethernet network port

Clock

Set the current time and data

Start Channel

Set the start channel of the Load Cell Monitor 100

Send PHC

Setup sending of channels to an IBEX Programmable Hoist Controller

Contrast

Set the screen contrast

Clear Logs

Erase all of the log data

Configure Cell

Using the Load Cell Setup port, discover the ID of a connected load cell and program a new ID into a connected load cell.

Email

Configure automatic send and receive of email (Plus Model Only)

Reset

Reset the Load Cell Monitor memory back to the factory state

SETUP LOAD CELLS

CHANNEL TO SETUP
Select the Load Cell
Channel to setup:
1
NEXT >

Select the load cell channel to setup. This is the Load Cell Monitor 100 channel that will be used to read this load cell.

CHANNEL PORT
Select the Port the
Load Cell is connected
to, or clear to disable:
3
NEXT >

Select the load cell port that this load cell is connected to. If you want to clear this channel from being connected to a load cell then press the clear button and no further options will be presented.

LOAD CELL ID
Enter the Load Cell
ID number:
256
NEXT >

Enter the ID number of this load cell. The ID number is the unique ID that is programmed into the load cell and is the address the Load Cell Monitor 100 uses to communicate with it.

LOAD CELL NAME
Enter and optional name
For this channel:
TRUSS A-1
< BLANK NEXT >

If desired a text name may be entered for this load cell channel which is displayed in the various Load Cell Monitor 100 screens with the channel number. Use the numeric keypad to enter the name, pressing each button multiple times to select the desired character. Press the BLANK button to clear the entered name.

SETUP COMPLETE	
Channel : 1	
Port: 3	
Load Cell ID: 256	
Name: TRUSS A-1	
< Cancel	STORE >

All of the required information has been entered and a confirmation screen is displayed. To store the new setup for this channel press STORE, or to cancel without storing press Cancel.

After setting up load cell channels you can confirm the changes made using the 'Utilities' > 'View Channel Setup' menu option.

SETUP MAXIMUM WEIGHTS

CHANNEL TO SETUP	
Select the First Load Cell Channel to setup:	
1	
NEXT >	

Enter the first load cell channel to setup.

CHANNEL TO SETUP	
Select the Last Load Cell Channel to setup:	
1	
NEXT >	

If you are setting the maximum weight of a single channel leave the last channel set to the same value as the first channel. To set the maximum weight of a range of channels at the same time enter the last channel to setup.

MAX WEIGHT	
Enter the maximum Weight or press Clear to disable:	
2000 Kg	
STORE >	

Enter the maximum weight value. This is the value that will be used by the Load Cell monitor to detect and overload condition and trigger an alarm. If no alarm detection is required press Clear to disable the maximum weight function on this channel / these channels.

After setting up maximum weights you can confirm the changes made using the 'Utilities' > 'View Max Weights' menu option.

SETUP SECURITY

SETUP SECURITY	
Require PIN to enter Setup menu:	
< ENABLED	NEXT >

To protect against unauthorised users altering the setup of the Load Cell Monitor 100 a PIN number may be set that must be entered when entering the Setup menu. Enable or disable this function and then press NEXT or STORE.

SET SECURITY CODE	
Enter security unlock code:	
1234	
STORE >	

If security has been enabled now enter the PIN code that must be entered to enter the Setup menu and then press STORE.

Note that when security is enabled and the correct PIN code is used to enter the Setup menu, the Load Cell Monitor will unlock for 4 minutes, before re-locking and requiring the PIN code to be entered the next time the Setup menu is selected.

In the event of the user password being forgotten the Load Cell Monitor 100 has a master password. This is '1846'.

SETUP NETWORK

NETWORK MENU	
< View Status	
< Set IP Address	
< Set Network Name	

View Status

View the current status of the Ethernet network connection

Set IP Address

Set the IP address and Subnet mask to be used, or DHCP for automatic network setup.

Set Network Name

Set the network name of the Load Cell Monitor 100

VIEW STATUS

NETWORK STATUS
Connected: Yes (DHCP)
IP: 192.168.0.6
Subnet: 255.255.255.0
Name: LOADCELL-MON100

The current status of the network is shown:

Connected	'No' if no network connection is present, or if DHCP is selected and no DHCP server has been found yet. 'Yes' if the network connection is made. If DHCP is selected then (DHCP) is also displayed to indicate that this is how the IP address and subnet mask we're obtained.
IP	The Load Cell Monitor 100 IP address
Subnet	The Load Cell Monitor 100 subnet mask
Name	The Load Cell Monitor 100 network name

The screen is refreshed every few seconds.

SET IP ADDRESS

IP SETUP
Use manual IP address or DHCP
< Manual IP
NEXT >

Select manual IP address configuration or automatic DHCP IP address configuration. DHCP stands for Dynamic Host Configuration Protocol and requires a network to have a DHCP server to issue IP addresses automatically. When selected the Load Cell Monitor 100 will look for the DHCP server on power up and will connect to the network once an IP address and subnet mask has been obtained from the DHCP server.

SET IP ADDRESS
Enter IP address:
192.168. 0.110
< NEXT VALUE
NEXT >

If manual was selected now enter the IP address to be used. Navigate between each of the 4 byte values using the NEXT VALUE button.

SET SUBNET MASK	
Enter Subnet Mask: 255.255.255. 0	
< NEXT VALUE	NEXT >

Now enter the subnet mask to be used. Navigate between each of the 4 byte values using the NEXT VALUE button.

SET GATEWAY	
Enter IP Address: 192.168. 0. 1	
< NEXT VALUE	DONE >

Now enter the network gateway IP address. This is required for email functionality, but may be set to 0.0.0.0 if no gateway is present and email functions are not being used. Navigate between each of the 4 byte values using the NEXT VALUE button. Press DONE to finish.

SET NETWORK NAME

SET NETWORK NAME	
Enter NetBIOS Name: LOADCELL-MON100	
STORE >	

The default network name may be changed using this function.

SETUP CLOCK

SET TIME & DATE	
Set Hours: 14	
NEXT >	

Use this function to set the current time and date. Note that the time is entered as 24 hour.

SETUP START CHANNEL

START CHANNEL	
Set channel number for The 1st channel of this Unit (Default = 1) 1	
STORE >	

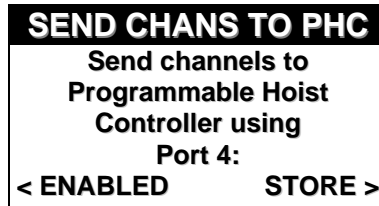
If two Load Cell Monitor 100's are being used together with the Hoist-Net PC application, or the Load Cell Monitor 100 is being used with a Programmable Hoist Controller and the Hoist-Net PC application then the

start channel may require setting to a value other than 1. For instance if the Load Cell Monitor 100 is used with a single Programmable Hoist Controller, then the Programmable Hoist Controller will output channels 1 -24 to the Hoist-Net PC application. In this case the Load Cell Monitor 100 start channel should be set to 25, so that it outputs channels 25 – 124.

When a different start channel is used this will alter the channel numbers displayed by and entered into the Load Cell Monitor 100 accordingly.

If the Load Cell Monitor 100 is being used on its own then the start channel can be left as 1.

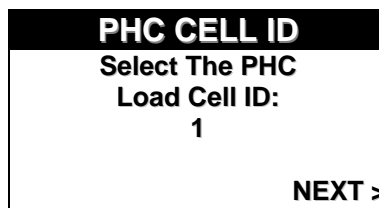
SETUP SEND CHANNELS TO PHC



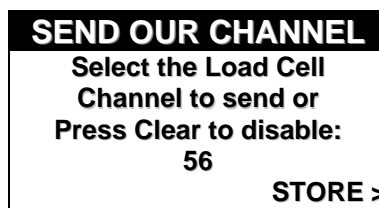
The Load Cell Monitor 100 may be configured to send selected load cell channels to an IBEX Programmable Hoist Controller

The sending of load cell channels to a Programmable Hoist controller works on the following basis. The Programmable Hoist Controller load cell port is connected to port 4 of the Load Cell Monitor 100. The Load Cell Monitor will change its operation of port 4 so that instead of reading load cells it waits to receive load cell requests from the Programmable Hoist controller. If a request is received for a PHC load cell ID that is configured to send a load cell channel then the Load Cell Monitor 100 responds with the current weight of that load cell channel. Operation is completely normal for both the Load Cell monitor 100 and the Programmable Hoist controller, except that the Load Cell Monitor 100 cannot use port 4 to read load cells as normal and is therefore only capable of reading up to 75 load cells connected to the other 3 ports. Each of the channels that is configured to be sent to the PHC is still displayed and monitored as normal by the Load Cell Monitor 100.

Enable or disable this function and press STORE.



If this function is enabled now select the PHC load cell ID to setup. The range of available ID's is 1 – 24 and it is assumed that for ease of operation that the PHC will be setup with channels that use a load cell using a load cell ID that matches the PHC channel number (1-24).



Select the Load Cell Monitor 100 channel weight that should be returned when a request is received from the PHC for the selected ID. If no channel should be returned press the Clear button to disable this PHC load cell ID (nothing will be returned by the Load Cell monitor if this ID is received from the PHC).

Link Cable

A single twisted pair cable suitable for RS485 communications with overall screen should be used with an XLR4 plug fitted to each end:

XLR4 Plug	Cable	XLR4 Plug
1	Screen	1
2	Pair – A	2
3	Pair – B	3
4		4

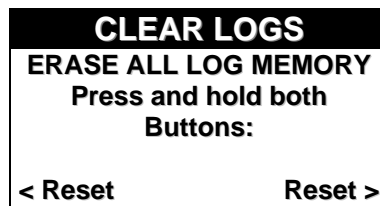
Note that pin 4 must not be connected.

SET SCREEN CONTRAST



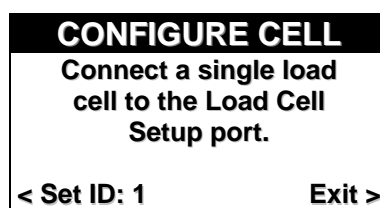
Use the up and down buttons to alter the screen contrast and then press STORE.

CLEAR LOGS



This function will clear the Load Cell Monitor 100 log memory.

CONFIGURE CELL



This function may be used when installing a new system to program the node ID of individual load cells (and confirm they are functioning). The node ID of a load cell is its RS485 communications address that is typically programmed by the load cell manufacturer when a new load cell is made.

Connect the load cell to the 'Load Cell Setup' port on the rear of the Load cell Monitor. Ensure that only 1 load cell is connected. (If the cable is short there is no need for a terminating resistor to be added to the end of the cable).

Use the up and down buttons or numeric keypad to enter a new node ID value and then press the Set ID button. The screen will confirm the ID is being set by displaying "Setting..." followed by "SUCCESS!" or "FAILURE!". If failure is displayed then the cell did not respond using the new address so there is a fault with the cell of the cable.

There is a delay of approximately 4 seconds while the node ID is set. This is due to the Load Cell Monitor assuming that a new load cell may have been connected for the first time each time the Set ID button is pressed. It therefore carries out all of the initialisation functions required for a new load cell to talk to the Load Cell Monitor and then programs the node ID. This process requires the load cell to be reset twice which is why there is a delay for it to complete.

Note that this function is not required to be used for new cells. The initialisation procedure of all load cells is also carried out automatically on each port each time the Load Cell Monitor is powered up.

EMAIL



Email functions are available on the Load Cell Monitor 100 Plus model only.

The Load Cell Monitor may be configured to automatically send an email to a pre-set address every time an alarm event occurs and optionally every day, week or month. The email sent will contain details of the alarm event that occurred or the current live weights of each load cell and will have a .csv spreadsheet log file attached containing details of the most recent log events.

The Load Cell monitor may also be configured to automatically check a POP3 mailbox periodically (hourly) for an email addressed to it. When a valid email is received the Load Cell monitor will automatically reply with the current live weights of each load cell and with a .csv spreadsheet log file attached containing details of the most recent log events.

Send email setup

Follow the prompts to enter the following information:

- Enable send email
- SMTP server (up to 30 characters)
- Login username (also the 'from' email address that will be used) (up to 30 characters).
- Login password (up to 16 characters). Leave blank if authentication not required.
- Send to email address (up to 30 characters)

Then select whether emails should be sent daily, weekly, monthly or none except alarms.

On completion of the send email setup the Load Cell Monitor will immediately attempt to send an email (this will occur even if the settings have not be altered and may be used to test emailing).

Receive email setup

Follow the prompts to enter the following information:

- Enable receive email
- POP3 server (up to 30 characters)
- Login username (up to 30 characters)
- Login password (up to 16 characters)
- Subject line ID value that must be present in an email for this Load Cell Monitor to read it and respond. (0000 – 9999)

On completion of the receive email setup the Load Cell Monitor will immediately check for received email (this will occur even if the settings have not be altered and may be used to test emailing).

To request the Load Cell Monitor to respond via email simply send an email to the POP3 mailbox, with the subject line contents starting with the ID value entered. The Load Cell Monitor will check the POP3 mailbox for email every hour.

For the Load Cell Monitor to be able to receive and send emails the connected Ethernet network must provide a gateway to the internet. This is typically a simple router or server that provides the connection to the internet for network devices. The router or server must provide DNS lookup functionality (i.e. when the Load Cell Monitor sends a DNS request to the gateway it must perform the DNS lookup and return the address - this is a typical gateway function).

RESET MEMORY

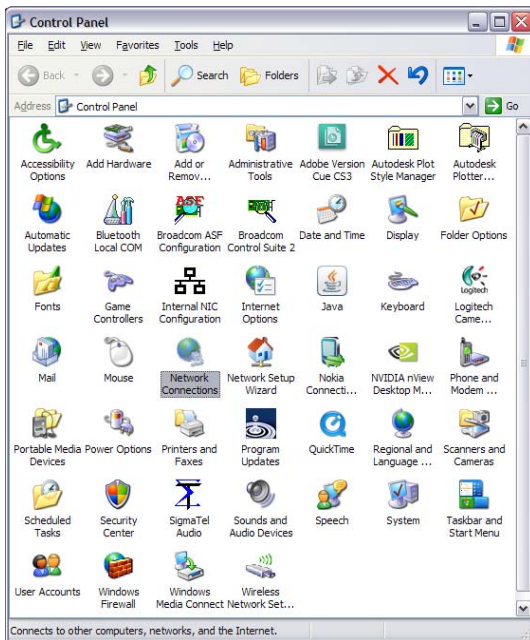


This function will reset the Load Cell Monitor 100 memory back to the factory default state. All setup configuration will be deleted.

HOIST-NET PC APPLICATION

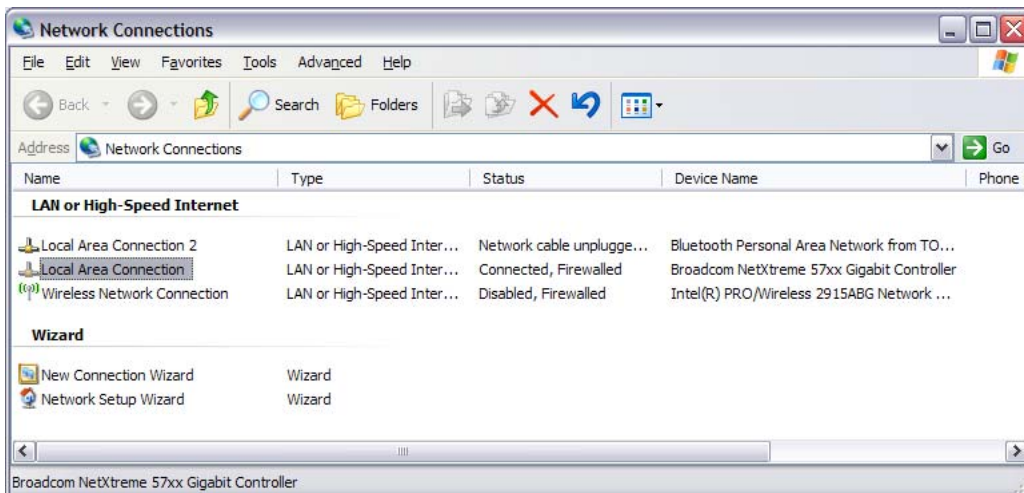
CONNECTING A PC TO THE NETWORK

For a PC to be able to connect to a Load Cell Monitor 100 it will need an Ethernet port, and its networking parameters setup to match the Load Cell Monitor 100. Different versions of Windows deal with network settings in slightly different ways, but the following, based on Windows XP, is a good guide:

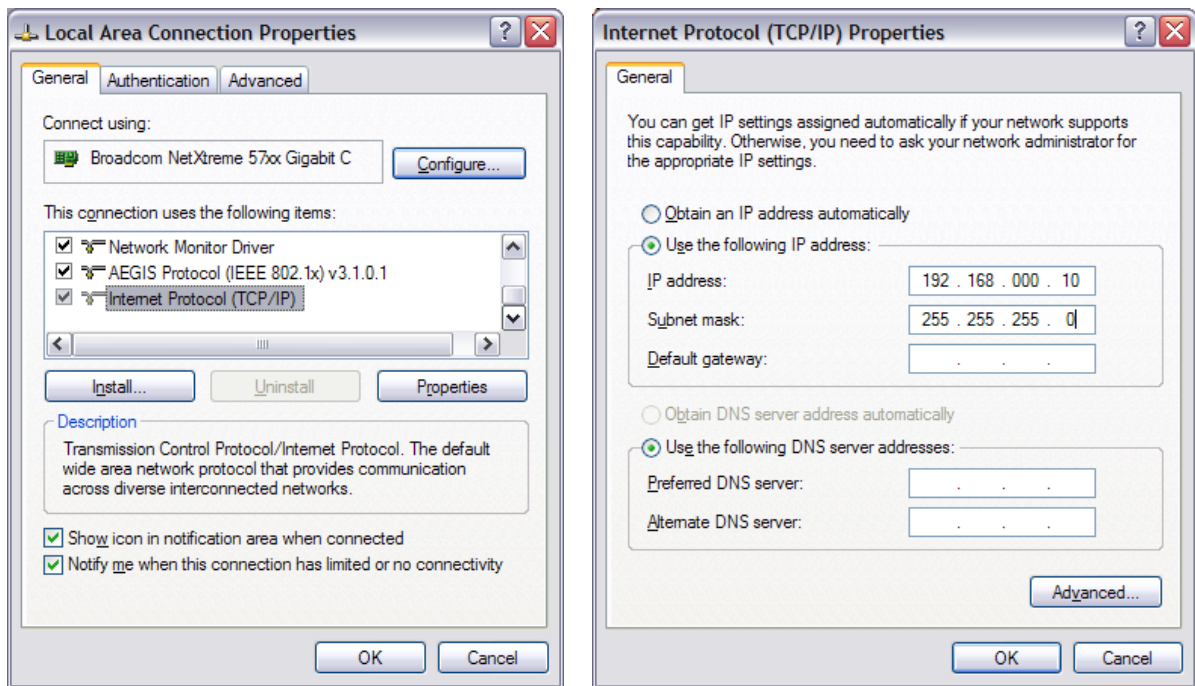


Go to the Windows Control Panel and select the 'Network Connections' icon.

Select the network connection to be setup. You may have more than 1 connection in which case select the one that is for the wired Ethernet port (i.e. not Bluetooth, not Wireless etc).



Double click it to open the connection window.



There should be a 'Local Area Connection' / 'Internet Protocol' specified as 'TCP/IP' for the network port (if not you need to create one using 'install').

Select the TCP/IP protocol line and then select 'Properties'.

Using DHCP

If your network has a DHCP server (for example a router in a simple network setup) then you may select the 'Obtain an IP address automatically' option to configure the PC to automatically get its network settings from the DHCP server. (The Load Cell Monitor 100 may also be configured to use DHCP).

Using a manual IP address

If no DHCP server is available, or if you are also using an IBEX Programmable Hoist Controller, then enter the network settings manually.

Select the 'Use the following IP address' option. Then enter '192.168.0.10' for the 'IP Address' and '255.255.255.0' for the 'Subnet Mask'. Select OK. A DNS server address is not required.

Note that if more than 1 PC is to be connected to the network, each PC will require its own unique IP Address, i.e. 192.168.0.11 for the second PC etc. The '192.168.0' is the subnet part of the address which is fixed, the final number can be any number between 1 and 254. The only requirement is that is must be unique on the network. The PHC+ controllers use IP addresses 192.168.0.150 to 192.168.0.159 by default).

Your computer may have more than 1 Ethernet port, say a wired RJ45 socket and a wireless WiFi card. When using the Hoist Net-PC software it is advisable to disable any other Ethernet ports so that the software has no confusion about which Ethernet port to use. You can do this by right clicking on the other connection in the 'Network Connections' window and selecting 'Disable'.

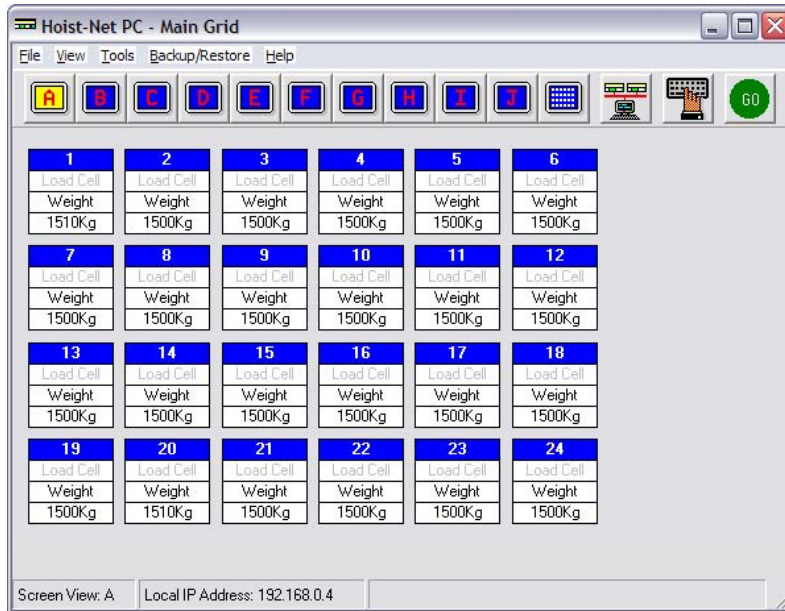
Your PC should now be setup to communicate with the Load Cell Monitor 100.

Note that if your PC is running any 'firewall' software, including Windows Firewall, this may automatically block communications between the PC and the Load Cell Monitor 100. The easiest way to determine this is to turn off the firewall software (with the computer disconnected from the Internet) and then see if network communications work correctly. Most firewall software will prompt you the first time you run Hoist-Net PC to ask if you wish to allow it through the firewall, but if not consult you firewall software documentation for further information

THE HOIST-NET PC APPLICATION

The application 'Hoist Net-PC' is available free of charge from IBEX. This application allows one or more PC's to show a full screen status display for up to 2 connected Load Cell Monitor 100's and up to 10 Programmable Hoist Controllers. Note that when using the application with only a Load Cell Monitor 100 some of the functions are not relevant and are therefore not covered in this manual.

The main screen



Operation

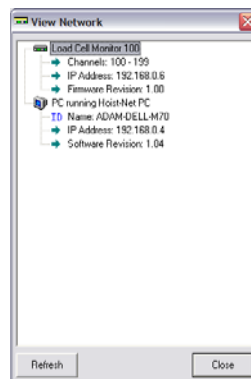
When the Load Cell Monitor is connected to the network the status of each channel will be displayed in its status box.

There are 10 separate screens, each of which may be configured to display a different set of channels. The channel status boxes may be moved around the screen, by dragging their blue channel number bar. This allows the status boxes to be laid out to represent the real world layout of the load cells being monitored. Use 'View' > 'Display Channels' from the menu to select which channels are displayed for each screen.

Use the 'File' menu to store screen layouts.

Network Status

Use 'Tools' > 'View Network' from the menu to display the current network status:



Each connected device is displayed together with its configuration.

Export Current Weights

Select this option from the Tools menu to export the current weight of each channel to a Microsoft Excel compatible .csv spreadsheet file.

System Requirements

An IBM-compatible PC running Windows 95, Windows 98, Windows ME, Windows 2000 or Windows XP.

Pentium 200MHz or higher processor

64MB RAM

CDROM drive

10BaseT compatible network card

Installation

Insert the application CDROM in the computers CDROM drive.

Select the start menu followed by the Run command.

Press browse and locate the CDROM drive.

Select the programme 'setup.exe' and press 'Open'.

Press 'OK' to run the setup procedure.

Follow the on screen instructions

COMMISSIONING A NEW SYSTEM

If all of your cabling and load cells function correctly then commissioning a new system will be as simple as configuring each of the required Load Cell Monitor channels to read each of the load cells. Once complete it is recommended that each load cell is physically verified that it has been configured to the correct Load Cell Monitor 100 channel. For instance you may be able to hang or stand on each load cell and verify that the correct channels weight changes on the Load Cell Monitor 100 screen. Alternatively you may be able to operate the equipment that causes each load cells reading to change and verify that the correct load cell channel reading changes for each load cell tested. This testing is important to ensure that incorrectly entering a load cell ID number, for instance, doesn't confuse operators or worse fail to generate an alarm in an overload condition.

Always ensure that the terminating resistor has been correctly fitted at the last load cell connection. If this resistor is not fitted intermittent communication faults can be caused, even if the system appears to be working without problems.

Problems With Commissioning

If you experience problems commissioning a new system the following are useful tips to help solve the problem:-

If you have multiple load cells connected to a port on the Load Cell Monitor then start by disconnecting all of the load cells except the first one. Ensure the Load Cell Monitor 100 is configured to read the weight from this load cell. Once the first load cell is working connect the next load cell and repeat. At some point you will find that connecting the next load cell doesn't work, or even causes the previous load cells to stop working. This has then identified the point where there is faulty cable connection (likely) or a faulty load cell (less likely).

If your load cells have never been connected to the Load Cell Monitor 100 before then you should cycle the power to the Load Cell Monitor 100 after each new load cell is connected when following this procedure. This is because the load cells may have previously been configured to use a different BAUD rate to the rate used by the Load Cell Monitor 100. The BAUD rate command is transmitted by the Load Cell Monitor 100 every time it is powered up, so if there was a cable fault when it was last powered up the connected load cells may have not received the previous BAUD rate setting command.

Check the voltage at the last cell load cell connection on a port. Whilst there will be some voltage drop along a long cable run it should not be too significant. The Load Cell Monitor outputs between 11.5V and 12.5V (DC, on XLR pins 1 and 4). If the voltage reading after a load cell is below around 7.0V then there is either a connection problem or the gauge of cable being used is not big enough.

Ensure that the terminating resistor has been correctly fitted at the last load cell connection. If this resistor is not fitted intermittent communication faults can be caused.

Ensure there are no 'Y' splits in the cable run. Very short 'Y' splits at individual cells are acceptable for cells that have only a single cable connection, but the main cable run must not be split into two or more separate cable runs.

Ensure that good RS485 data cable installation practice has been followed. Cable screens should be kept isolated from metalwork where possible to avoid the possibility of ground loops. Good quality cable with shielding suitable for RS485 communications should have been used and the pair of data cores should be twisted.

If you have a cell that you are unable to get to work the 'Configure Cell' function, which is described earlier in this manual, may be used to try and reset the cell's communication ID. This function will confirm if the process was successful, and therefore confirms if the cell is working as well as ensuring it has been configured with the ID you think it has been configured to use.

If an alarm is being triggered due to cells not responding you may press the Silence button a second time to hide the alarm screen and view the general status screen, allowing you to see the status of all cell channels.

SPECIFICATIONS

Size

2U 19" rack mount unit, 220mm deep

Mains Input

IEC plug

Mains input voltage

85 – 260VAC 50/60Hz

Operating current

Up to 1.65A (10A type C circuit breaker recommended for brief power on surge current)

This product must be earthed.

Load Cells

This product is designed to be used with load cells that incorporate the Mantracourt DCell RS485 ASCII load cell amplifier. Each load cell should incorporate a 4 pin 'in' and a 4 pin 'out' connection.

Note that Load Cell Monitor 100 will automatically set the baud rate of the load cells on power up to 4 (38K4) if the load cells have previously been set to baud rate 7 (115K2), 6 (76K8), 5 (57K6), 3 (19K2) or 2 (9K6).

Output voltage

12V DC

Max current per port

1.6A (protected by internal self resetting electronic fuses).

See connections section for cable requirements.

Load cell weight resolution

1.0Kg

Allowable load cell weight range

0Kg to +59999Kg (negative weight readings are accepted but are converted to 0Kg)

Maximum number of load cells per port

25

Maximum total number of load cells

100 (75 if Load Cell Monitor 100 is configured to send load cell channels to an IBEX Programmable Hoist Controller)

Load cell update time

All 25 channels on a single port are normally updated every 500mS. Individual ports function independently from each other.

Maximum update time 1.5 seconds (if all channels on a port are not responding or if older slow to respond load cells are used).

Alarm trigger time

Between 1x and 2x the load cell update time

Mantracourt DCell sampling rate

5Hz

Alarm Output

Two normally open volt free relay contacts rated at 500mA 24VDC.

12V DC power output that may be used to power external devices if required. Maximum current 900mA (protected by an internal self resetting electronic fuse).

Ethernet

10Base-T

Neutrik Ethercon socket (standard RJ45 compatible)



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