flexa
SENSORS

Flexa Sensors Load Cells

weigh the moment

IoT

Real-Time

LC-NLP

Flexa Sensors' Load Cells

Three Needs. Three Solutions. Three Platforms.

The demand for safety in both **temporary and permanent event** setups is increasing. Understanding suspended loads is an essential component in assessing structural risks.

Flexa Sensors is part of a leading group in the event structures industry. Our daily experience dealing with safety a spects drives us to seek new and specific solutions to improve the riggers work.

Flexa Sensors offers three solutions that provide the information riggers and structural engineers seek:

Real-Time

The Real-Time line is more suitable for managing up to a hundred wireless cells. The system requires a local PC connected to a gateway, and data are updated **every second.**

IoT

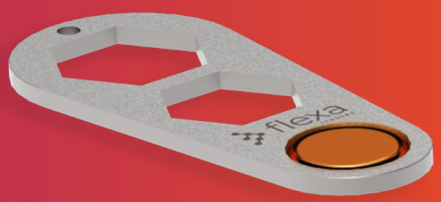
The IoT line is suitable for managing large networks with thousands of nodes that connect to the cloud through one or more gateways. Data are updated approximately every **three minutes,** and all information can be accessed by multiple devices connected to the internet.

LC-NLP

The LC-NLP line monitors the loads within a wired safety loop. The cable connection ensures **constant load control** and an automatic reaction in case of anomalies. In the event a glitch occurs, it immediately disconnects the power supply to the hoists.

The Magnetic Key

To ensure **high IP protection,** the cells are not equipped with external mechanical switches. Instead, a magnetic key provided with the cells can activate a magnetic switch, which is turned on or off by placing the key close to the cell's cylindrical cap (for IoT and Real-Time lines only).



Real-Time

Wirelessly Controlling Loads Has Never Been Easier

The Flexa Real- Time line mainly consists of two cell modules: One is a based on **Van Beest shackles,** and the other is in the form of a **dynamometer**. Both use a proprietary transmission protocol that connects them to the gateway or multiple repeaters.

If you're setting up a stage (small or large), or placing delay towers among the crowd, you need immediate and accurate information about the static or dynamic loads with which you're dealing.

The Real- Time line updates you every second on a monitor, indicating whether each cell's state is regular, overloaded, or under-loaded.

A Revolutionary Solution for Wireless Load cells

SHACKLE LOAD CELL

The shackle cell is a preferred standard among riggers. It is based on Van Beest shackles aand are supplied in two versions: 4.75t and 3.25t WLL, with a safety **factor of 5:1 and an IP 65** rating.

DYNACELL

DynaCell expands the FLEXA control eco-system's scope with a unique, ultra-compact, and totally versatile range of wireless load cell sensors. A new, super-stylish, ergonomic design is available in two models: the 500kg WLL aluminium version and the 5t WLL stainless steel version. Both have an **8:1 safety factor and a IP65 rating.**

Real-Time

The Shackle Load Cell, The Reinvented Standard.

Four strain gauges are embedded in the resin inside the pin. **No external cavities and the high technological level ensure maximum safety.**

The CR 123 batteries are compact and borrow design features from the camera industry to ensure stable performance and long life. The cylinder shape of the enclosure limits shocks and the anti-rotation ring is integrated into the pin, **leaving the upper part of the shackle free.**

DynaCell, the Most Versatile Evolution

DynaCell is available in both aluminium and stainless-steel versions and measures 12cm between hole centres. The aluminium model weighs only **300g** and is provided exclusively in a black anodised version. The stainless-steel model weighs **980g** and comes with a matte, sandblasted steel finish.

Real-Time

Electric Chain Hoist Goes Wireless!

The Real-time platform is also available as an integrated version into the **EXE RISE chain hoists.** The load cell is integrated into the upper hook. There are no cables or switches.

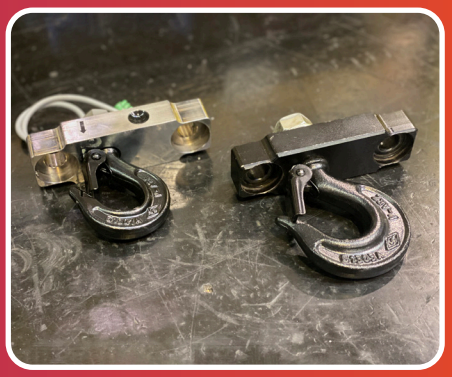
SKILLS SYNERGY

The joint work between FLEXA and EXE TECHNOLOGY product development teams resulted in the Flexa Sensors platform being integrated on board the EXE RISE hoists.

This wireless technology, applied to electric chain hoists, offers maximum freedom in handling hoists and covers distances up to 600 metres from the gateway.

The Cell Integrated in the Hook

The load cell module is perfectly integrated in the steel block that connects the electric hoist to the hook. This setup eliminates external wires **without losing any height,** compared to a solution based on an external cell a true technological masterpiece!



EXCLUSIVE DESIGN

The Flexa module with the microprocessor and the radio section is mounted on one of the two hoist side covers.

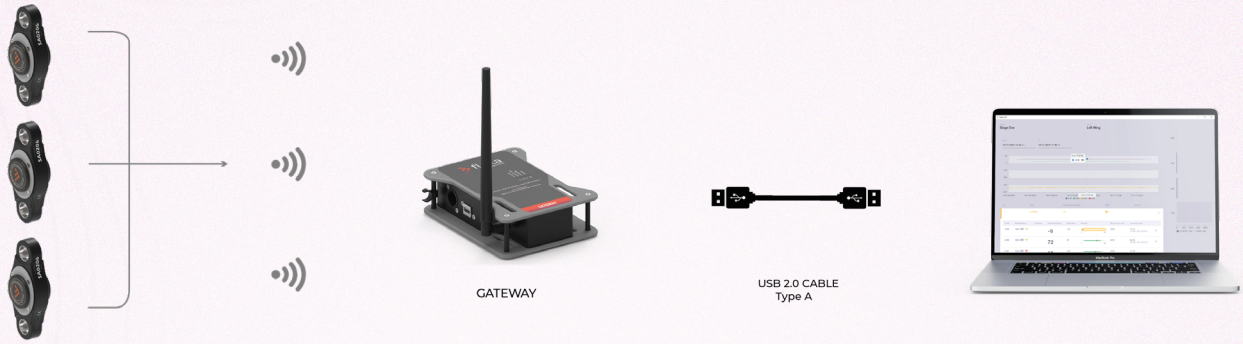
The externally-mounted **anti-shock antenna** offers a high degree of efficiency, even in difficult conditions for radio waves, such as in stage roofs. The module is connected to the EXE CELL system, which integrates the load cell inside the hoist hook of the EXE RISE chain hoists.

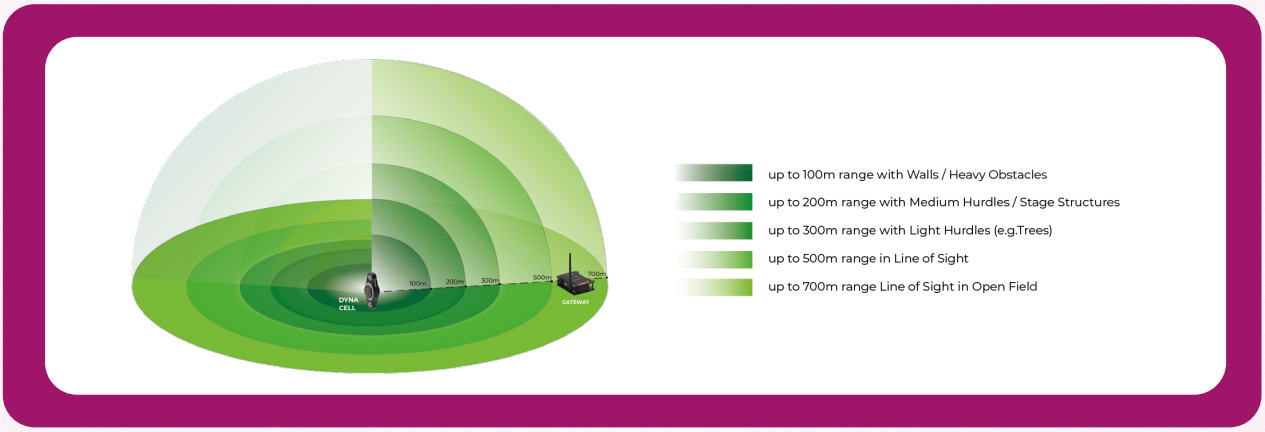
The final result is a unique design with unparalleled practicality for daily use.

Real-Time

How It Works

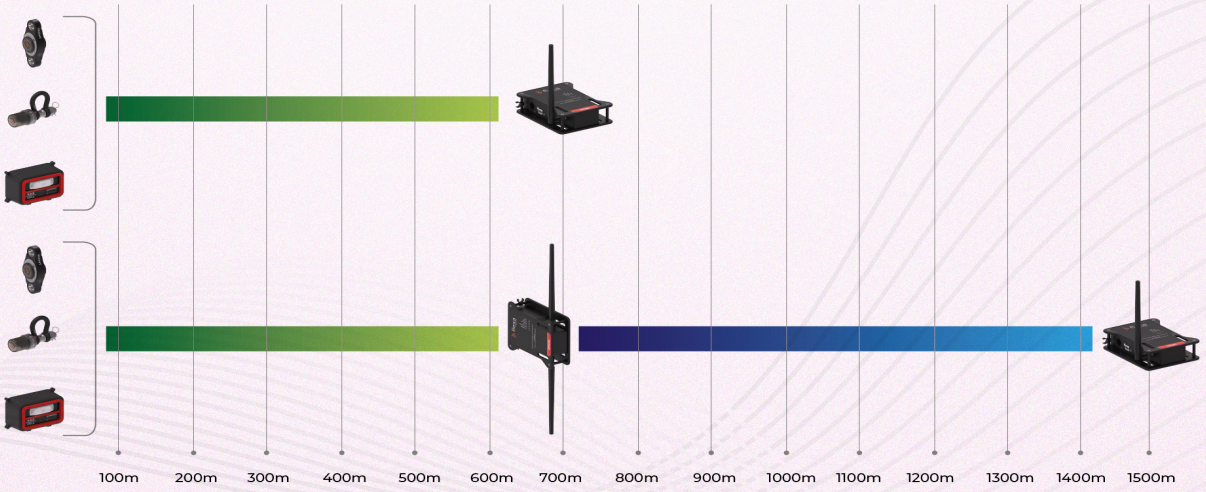
Environmental conditions affect every radio transmission. The **distances calculated in line of sight** on an open field are different from the real ones in the presence of different obstacles. The graphs below show different ranges, based on the environment in which the system operates.





In most common uses, the gateway connects directly to active cells. In critical radio signal transmission conditions, **repeaters may be necessary.**

In this case, the gateway connects exclusively to the repeaters (up to a maximum of five units).



Real-Time

Gateway And Repeater: The Coordinators

THE GATEWAY: THE SYSTEM'S CORE

The gateway is not a merely a simple data conveyor; it's an intelligent machine that constantly communicates with cells or repeaters.

THE REPEATER: FOR HOSTILE CONDITIONS

Each setup is different. To cover distances over 600m between cells and gateway, or **when significant obstacles** must be overcome, it may be necessary to add one or more repeaters.

Under normal operating conditions, the gateway adequately covers the working area, but a **repeater is necessary** when the distance to the cell is greater than 500/600m or when significant obstacles must be circumvented using devices in triangulation.

The system requires **the gateway to always be on, to maintain the connection with the load cells.** If the load cells are on and don't find their active gateway, the cells will consume a lot of battery. For this reason, each gateway has three power systems that make it independent of the PC connection.

- Four RGB LEDs
- Plug & Play installation (no radio set up)
- Max No of cells: 100 units
- USB-A port to PC

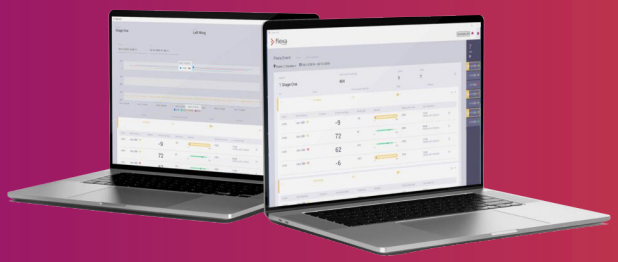
- Six RGB LEDs
- Wireless connection from cells to the Gateway
- Max No of Repeaters per Gateway: 5 units
- Transceiver with 2 antennas

Real-Time

From Cells To Screen

The **Flexa Control software** is the operational intelligence that allows the management of cells and all parameters. The in-formation is grouped by **Event, Sectors, and Zones. Each zone is populated by cells.**

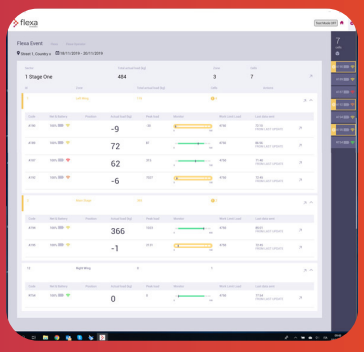
For each cell, information on the load, its history, load charts, battery charge values, and the radio signal quality is always available. Each sector, zone, or cell has its own interface page that can be opened individually or simultaneously with other pages on multiple screens.

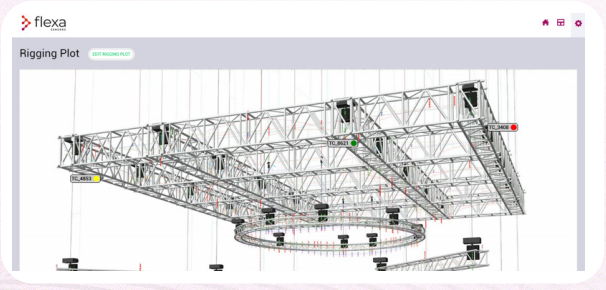


For data visualisation, the **PC must always be connected to the Gateway with the USB cable.** Without this condition, data can't be visualised, and all information coming from the cells will be lost. The gateway must remain on even without the PC connection, just to mantein the network of connected cells on.

TRY OUR SOFTWARE EVEN WITHOUT HAVING THE CELLS

Our software is ready to manage the cells. In addition, it has a test section that allows you to **simulate the operation with virtual cells:** you can create your event, divide it into sectors and zones and populate it with cells. An automatic process will simulate virtual load readings that will respond to the load limits you have entered for each cell.





DRAG & DROP ON YOUR RIGGING PLOT

The updated version, operational from March 2023, of the Flexa Control software allows for the manual placement of cells overlaid on an image, typically a **rigging plot,** for immediate viewing of the cell's position with an indication of the **code, load, and signaling of load level status.**

IoT

The Load On The Cloud

The Internet of Things Based on LoRaWAN® Protocol

This system is designed mainly for exhibition halls and any other applications where constant monitoring of hundreds of loads is required, even over large distances.

Hanging large structures from trade fair ceilings has been an established trend for many years, and almost all exhibition centres set **load limitations** for each individual ceiling hanging point. Clearly, without load measurements no one is able to define exactly how much weight is attached to each single point.

Wireless load cells are the simplest and most precise answer to this need.

In an exhibition hall, many “nodes” (hundreds or even thousands) can read the applied load. They must be accessible via **several devices at the same time.**

LoRaWAN®

CLOUD OPERATING – IoT LINE

The IoT line is natively built on the cloud, following the Internet of Things trend. Each cell measures the associated load and transmits every three minutes (on average) to the cloud via gateways, following the LoRaWAN® standard.

This solution is suitable for managing hundreds of load cells or other sensors. The main purpose is to continually monitor loads with many hanging points over large areas, in order to compare the hanging loads with the building's structural limits.

LORAWAN® LOAD CELL

- LoRaWAN® Compliant
- WLL 500kg (S.F.: 8:1)
- ENAW-2024 T351 Aluminum
- 300g self-weight
- Smooth design

LORAWAN® INDOOR GATEWAY

- LoRaWAN® Compliant
- Range covered > 1000m
- 220V AC Supply
- RGB LEDs for status info
- SIM slot and RJ45 socket
- Indoor version

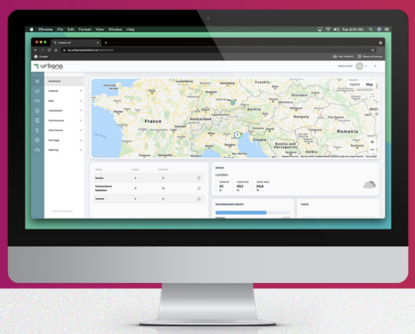
LORAWAN® OUTDOOR GATEWAY

- LoRaWAN® Compliant
- Range covered > 1000m
- 220V AC Supply
- RGB LEDs for status info
- SIM slot and RJ45 socket
- Outdoor version

IoT

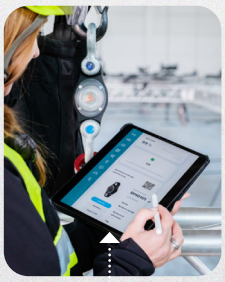
Based on LoRaWAN®

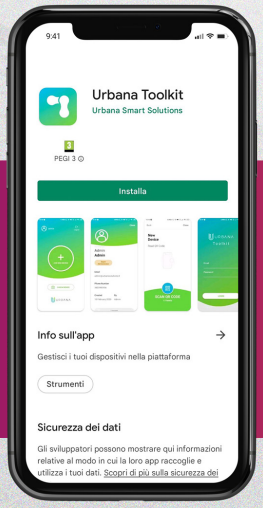
LoRaWAN is a low power, wide area (LPWA) networking protocol designed to wirelessly connect battery operated ‘things’ to the internet in regional, national, or global networks.



Each event is divided into halls, each hall is made up of stands, and each stand includes its own cells or other end nodes. Cells can be in the same building, in adjacent buildings, or even in different geographical locations.

In the IoT line, **each cell’s QR code is unique.** By framing the code from the app, all the cell’s information can be accessed. The cell specifications can then be entered from the app and automatically transferred to the cloud portal without having to transcribe them.



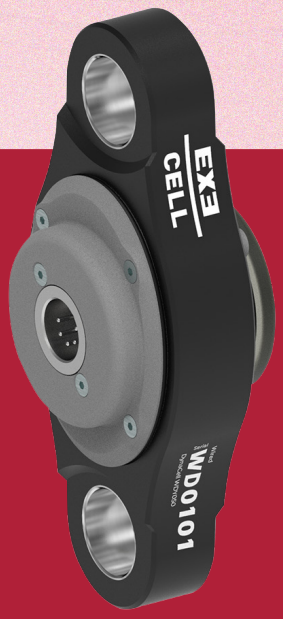


An app (which is responsive on both smartphones and tablets) allows you to manage all your cells, and all the functions and information are **also available via browser.**

Download on the App Store

GET IT ON Google Play

flexa SENSORS | EXE CELL | LC-NLP



Instant load control has never been so safe

The LC-NLP line monitors the loads within a wired safety loop. The cable connection ensures constant control of the loads and an automatic reaction in case of anomalies, causing the immediate disconnection of the power supply to the hoists.

FLEXA SENSORS AND EXE TECHNOLOGY

It is the combination of the **Flexa Dynacell load cell with the EXE NLP wired system.** The systems have the advantage of being constantly active and allowing **automatic responses in safety interventions.** These devices can be installed anywhere, without the worries of radio coverage and battery life limitations.

Even in the EXE version, the two DynaCell models (500kg and 5T) are available. The cells are equipped with the **XRL male connector** for wiring according to the NLP standard.

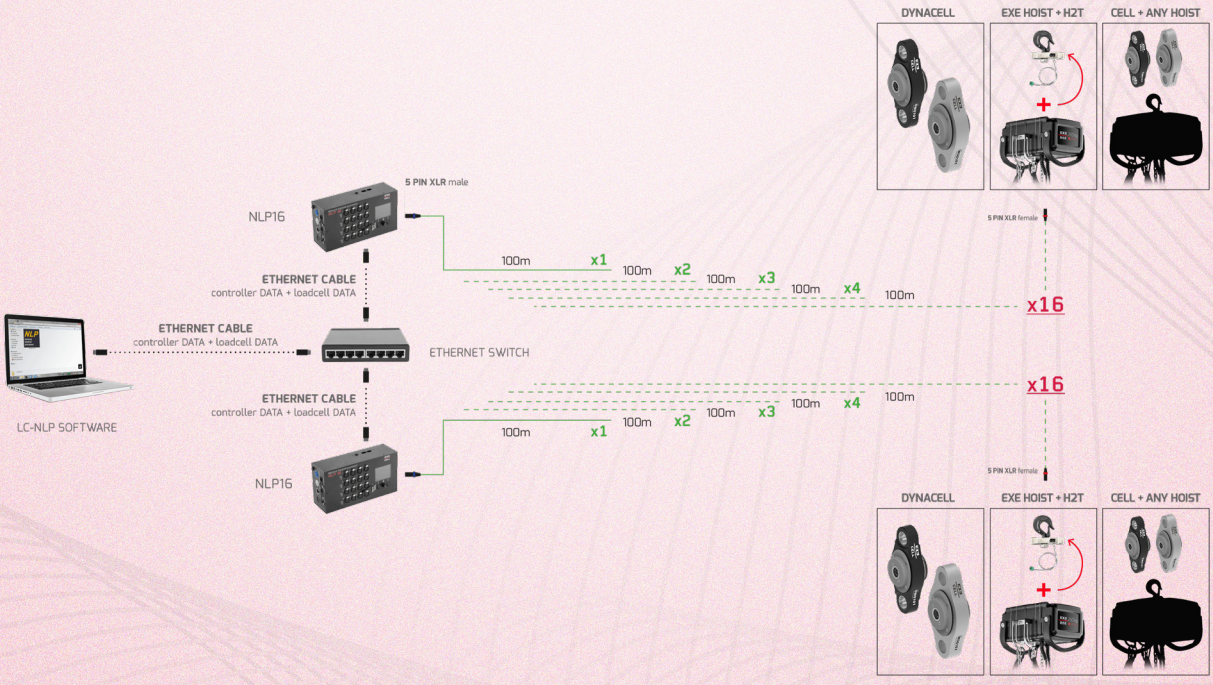
LC-NLP

The NLP Safety Loop

There is a **continuous** wired connection between the load cells, the Central Unit, the EXE DRIVE DL Controller, and the hoists.

When the NLP Unit receives an **overload** or **underload** data from the cell, it instantly activates communication to the controller that cut the power supply to the hoist.

Load monitoring and safety loop mode



The LC-NLP central unit manages incoming load data from the cells. In case of anomalies (overload), safety loop circuit is activated to **immediately cut the power supply to the hoists.**

The NLP unit connects HW cable E-STOP1 to the controllers of the entire EXE DRIVE DL SERIES (Linkable) **for automatic emergency stop activation.** An additional clean contact output can control other types of e- stops, such as for lighting devices or other motors.

CARRYING & STORAGE SOLUTIONS

Every professional in this industry must find a way to transport, store, and protect load cells and other devices. We have partnered with the manufacturers of the best hard cases in the world and selected a dedicated line of hard cases and customised interiors **to completely protect the equipment** against dust, water, shocks, and chemical corrosion.

They're watertight and resistant to dust, moisture, acids, and sand. They also have a **special valve that automatically adjusts the air pressure inside the case.** The cases provide maximum protection with minimal weight. They withstand falls and impacts and offer unparalleled protection and an easy storage solution for every tool of this trade.

- Single load cell case

- Gateway or Repeater case

- Six Shackle or six DynaCell case
- Slots for one Gateway and one Repeater

- 12 Shackle load cell or 12 Dynacell case
- Slots for one Gateway and one Repeater

The comparison between systems

IoT line

Data refresh period
3 Minutes
Data management platform
Cloud
Load Cell connection to Gateway
Wireless
Gateway connection to platform
Internet
Frequency
868/915 MHz
Network protocol
LoRaWAN®
Manual calibration of radio channels
No
Internet connection required
Yes
Concurrent data access from multiple devices
Yes
Remote monitoring
Yes
Max number of Cells per Gateway
≃300
Max number of Gateways per System
≃20
Max number of Repeaters per System
--
Max number of Cells per System
≃1000
User friendly platform
Yes
Drag & drop interface
Yes
Management fees
Yes
Active safety circuit (automatic e-stop)
No

Real-Time line

Data refresh period
1 Second
Data management platform
Local PC
Load Cell connection to Gateway
Wireless
Gateway connection to platform
USB Cable
Frequency
868/915 MHz
Network protocol
Proprietary
Manual calibration of radio channels
No
Internet connection required
No
Concurrent data access from multiple devices
No
Remote monitoring
No
Max number of Cells per Gateway
100
Max number of Gateways per System
1
Max number of Repeaters per System
2
Max number of Cells per System
≃100
User friendly platform
Yes
Drag & drop interface
Yes
Management fees
No
Active safety circuit (automatic e-stop)
No

LC-NLP line

Data refresh period
Instant
Data management platform
LC-NLP 16 Module
Load Cell connection to Gateway
XLR5 Cable
Gateway connection to platform
Ethernet Cable
Frequency
--
Network protocol
Proprietary
Manual calibration of radio channels
No
Internet connection required
No
Concurrent data access from multiple devices
No
Remote monitoring
No
Max number of Cells per Gateway
16
Max number of Gateways per System
2
Max number of Repeaters per System
--
Max number of Cells per System
32
User friendly platform
Yes
Drag & drop interface
No
Management fees
No
Active safety circuit (automatic e-stop)
Yes

The Main Products

Real-Time

CSH 325Z
3.25t WLL

CSH 475B
4.75t WLL

CDY 050X
500kg WLL

CDY 500h
5t WLL

SEE EXE CELL
HOIST RANGE

KC C100
Gateway

KC R100
Repeater

IoT

KMD 050X -
500kg WLL

MGWI
Indoor Gateway

MGWO
outdoor Gateway

LC-NLP

EX3
CELL

DY050X
500kg WLL

DY 500h
5t WLL

EXE LC
NLP 16

We believe that ever more precise and specific sensor networks will be of great help to event creators.

Our commitment is to ensure the best technology available to make their work safer and easier.

flexa SENSORS

www.flexasensors.com

Manufacturing in Italy and distribute Worldwide by

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