

LEONARDO PRO X



ONE PRODUCT FOR ALL SOLUTIONS

*ON-GRID RETROFIT
ON-GRID NEW PLANTS
OFF-GRID*



Leonardo PRO X

3000/5000

Caratteristiche prodotto



230V AC 50 Hz
Storage System



3000VA/5000VA
Output Power



95% Inverter
Efficiency

[eng]

Product features



Integrated LCD Display



"My Leonardo" App and
Web Platform for
Monitoring and Control



Ethernet Connection

[fra]

Caractéristiques du produit



Compatible with Major Lithium
Battery Manufacturers:
LG Chem
Pylontech
Midac



Battery Voltage 48 VDC



Expandable for power
extension and three-phase
systems



A MODULAR SYSTEM

*Aumenta la potenza
quando vuoi*

*[eng]
Increase the power
whenever you want*

*[fra]
Augmentez la puissance
quand vous le souhaitez*

Leonardo PROX 3000



| | |
|-------------------|----------------|
| Weight | 18kg |
| Dimensions | 271x502x143 mm |

UP TO 18kW

(1 Master + 5 Slave)

Espandibile fino a 6 moduli per una potenza totale di 18kW

[eng]
Expandable up to 6 modules for a total power of 18kW

[fra]
Extensible jusqu'à 6 modules pour une puissance totale de 18kW

Leonardo PROX 5000



| | |
|-------------------|----------------|
| Weight | 29kg |
| Dimensions | 317x560x143 mm |

UP TO 30kW

(1 Master + 5 Slave)

Espandibile fino a 6 moduli per una potenza totale di 30kW

[eng]
Expandable up to 6 modules for a total power of 30kW

[fra]
Extensible jusqu'à 6 modules pour une puissance totale de 30kW

Retrofit

Descrizione

Il **Leonardo PRO X** è la soluzione ideale per aggiungere un sistema di accumulo su impianti fotovoltaici già dotati di inverter di stringa AC On-Grid (Configurazione AC lato post-produzione) senza alterare la quantità di energia prodotta ed incentivata dall'impianto esistente. In caso di blackout della rete elettrica, il Leonardo PRO X alimenta le utenze collegate all'uscita EPS, con la potenza di targa dell'inverter senza limitazioni, con un tempo di ripristino inferiore ai 10 ms. È possibile abbinare al Leonardo PRO X la versione Slave, per espandere la potenza disponibile e/o per gestire impianti trifase. Disponibile in 2 versioni: 3000VA e 5000VA. I sistemi sono compatibili con i principali brand di batterie di accumulo al litio.

[eng]

Description

Leonardo PRO X is the ideal solution for adding a storage system to an existing photovoltaic systems already equipped with On-Grid AC string inverters (AC configuration on the post-production side) without changing the amount of energy produced and stimulated by the existing system. In case of blackout of the grid, Leonardo PRO X feeds the loads connected to the EPS output, based on inverter power without limitations, with a recovery time of less than 10 ms. It is possible to combine a Slave version with Leonardo PRO X, to expand the available power and / or to manage three-phase systems. Available in 2 versions: 3000VA and 5000VA. These systems are compatible with the main brands of lithium storage batteries.

[fra]

Description

Leonardo PRO X est la solution idéale pour ajouter un système de stockage à un système photovoltaïque existant déjà équipé d'onduleurs string AC On-Grid (configuration AC côté post-production) sans changer la quantité d'énergie produite et stimulée par le système existant. En cas de panne du réseau, Leonardo PRO X alimente les charges connectées à la sortie EPS, sur la base de la puissance de l'onduleur sans limitation, avec un temps de récupération inférieur à 10 ms. Il est possible de combiner une version Slave avec Leonardo PRO X, pour augmenter la puissance disponible et / ou pour gérer des systèmes triphasés. Disponible en 2 versions: 3000VA et 5000VA. Ces systèmes sont compatibles avec les principales marques de batteries de stockage au lithium.

Caratteristiche prodotto



EPS anti-blackout function (for privileged loads) with recovery time <10ms



PEAK SHAVING function to increase the power available in the home system

[eng]

Product features



AC overload and short circuit protection



Monitoring and parameter setting directly from the display (or remote console App My Leonardo)

[fra]

Caractéristiques du produit



Booster function for increase grid power disponibility

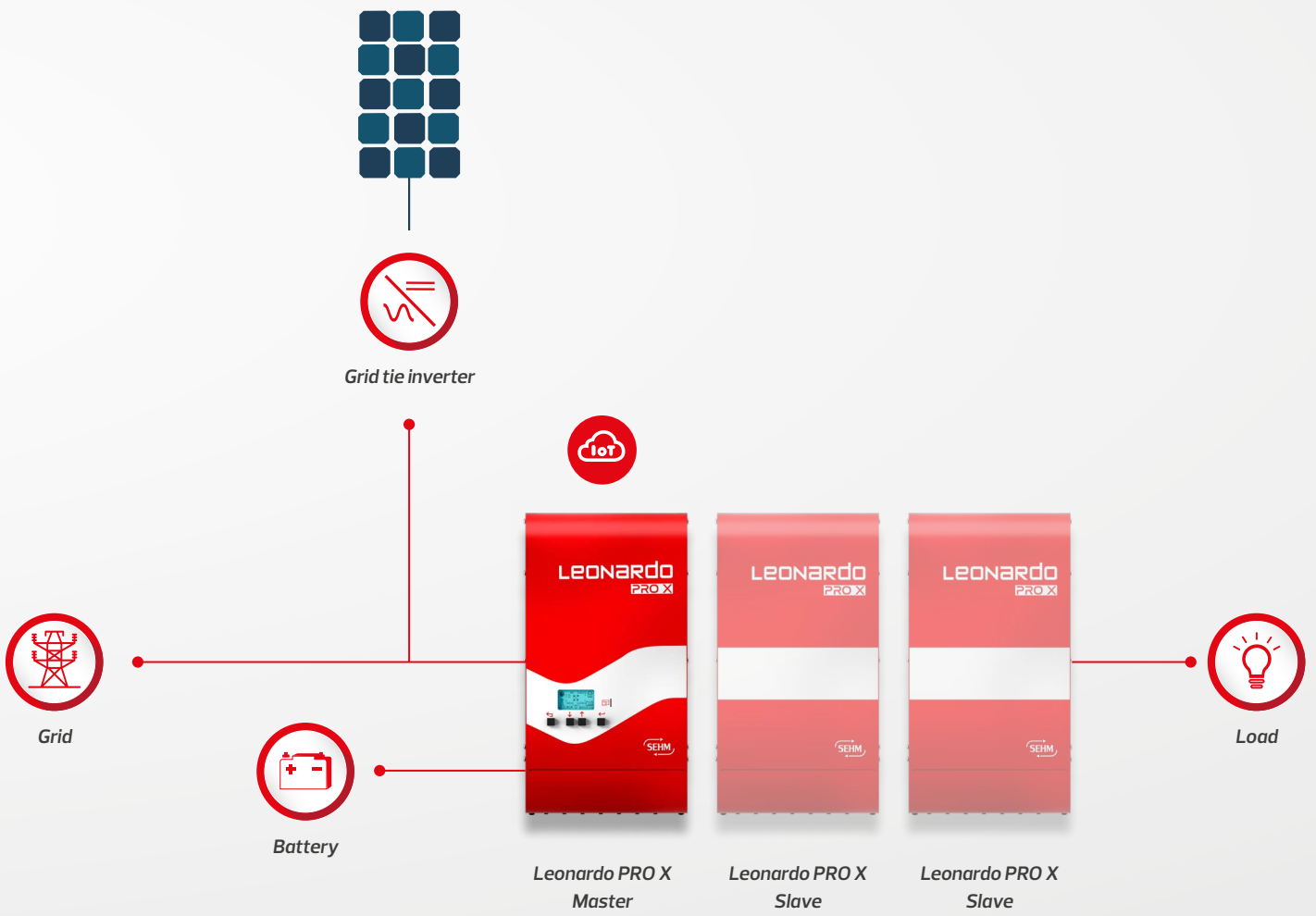


Remote control and integrated function management (to decrease on site operation maintenance)

Schema logico

[eng]
Logic diagram

[fra]
Schéma logique



New PV plants

Descrizione

Il **Leonardo PRO X** può essere accoppiato al regolatore di carica WRM30+ il quale gestisce la potenza fotovoltaica, così da essere utilizzato per la realizzazione di nuovi impianti FV con batteria di accumulo. (configurazione DC/AC). È possibile abbinare al Leonardo PRO X la versione Slave, per espandere la potenza disponibile e/o per gestire impianti trifase. Disponibile in 2 versioni: 3000VA e 5000VA. Grazie alla gestione del fotovoltaico a 48Vdc, in caso di blackout, oltre alla disponibilità della batteria, sarà possibile prelevare tutta l'energia istantanea generata dai moduli FV. I sistemi sono compatibili con i principali brand di batterie di accumulo al litio.

[eng]

Description

Leonardo PRO X can be paired with WRM30 + charge controller which manages the photovoltaic power, in order to be used for new PV systems with storage battery. (DC / AC configuration). It is possible to combine Slave version with Leonardo PRO X, to expand the available power and / or to manage three-phase systems. Available in 2 versions: 3000VA and 5000VA. Thanks to the 48Vdc photovoltaic management, in case of a blackout, in addition to battery availability, it is possible to withdraw all the instantaneous energy generated by the PV modules. The systems are compatible with main brands of lithium storage batteries.

[fra]

Description

Leonardo PRO X peut être couplé avec le contrôleur de charge WRM30 + qui gère l'énergie photovoltaïque, afin d'être utilisé pour les nouveaux systèmes PV avec batterie de stockage. (Configuration DC / AC). Il est possible de combiner la version Slave avec Leonardo PRO X, pour augmenter la puissance disponible et / ou pour gérer des systèmes triphasés. Disponible en 2 versions: 3000VA et 5000VA. Grâce à la gestion photovoltaïque 48Vdc, en cas de panne du réseau, en plus de la disponibilité de la batterie, il est possible de retirer toute l'énergie instantanée générée par les modules PV. Les systèmes sont compatibles avec les principales marques de batteries de stockage au lithium.

Caratteristiche prodotto



EPS anti-blackout function (function (Inverter Max Power dispoibility) with recovery time <10ms



PEAK SHAVING function to increase the power available in the home system

[eng]

Product features



AC overload and short circuit protection



Monitoring and parameter setting directly from the display (or remote console App My Leonardo)

[fra]

Caractéristiques du produit



Booster function for increase grid power dispoibility

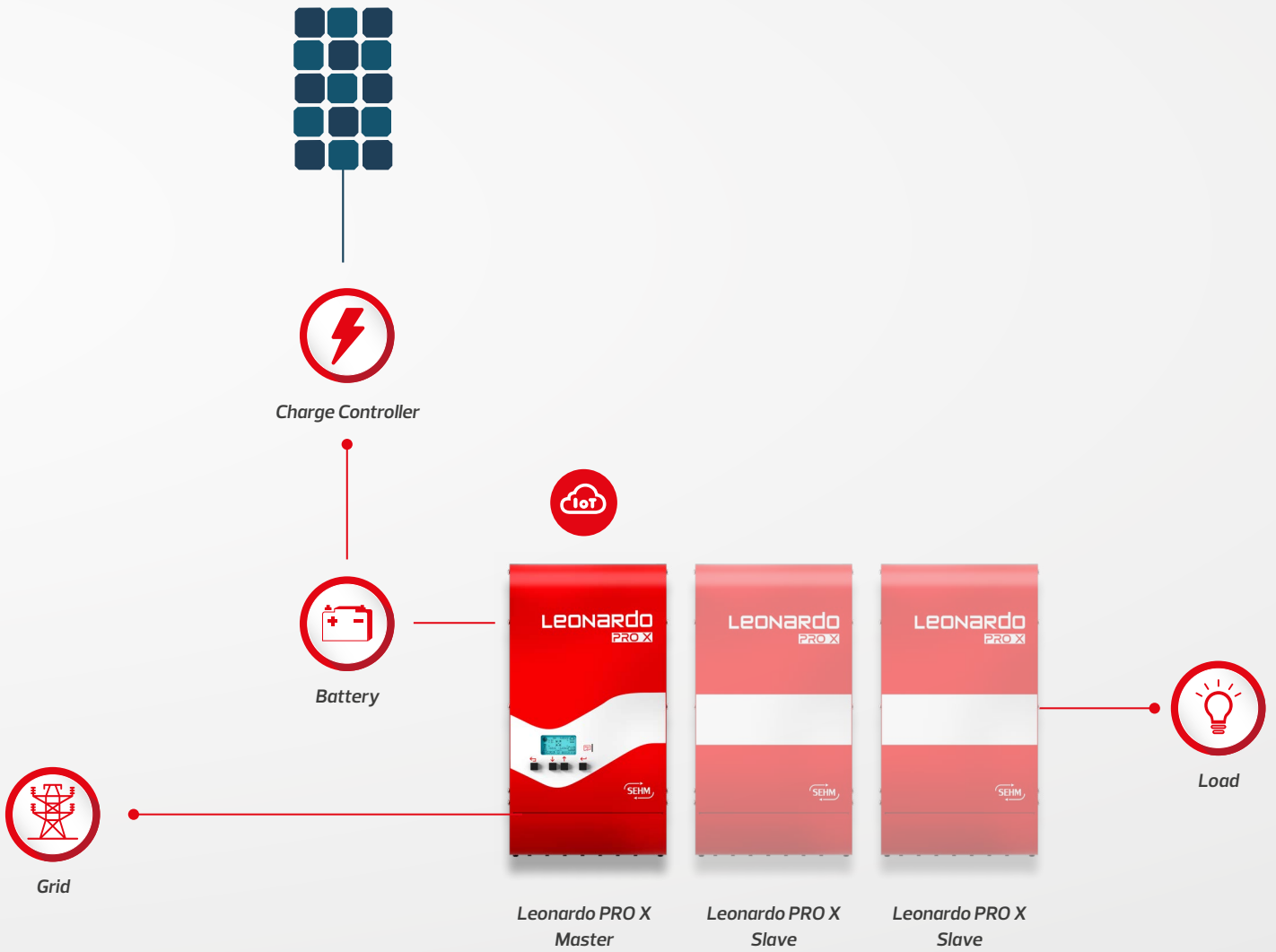


Remote control and integrated function management (to decrease on site operation maintenance)

Schema logico

[eng]
Logic diagram

[fra]
Schéma logique



Off-grid

Descrizione

Il **Leonardo PRO X** assieme ai regolatori di carica esterni WRM30+ può essere configurato anche in modalità off-grid (direttamente dal display) con backup di emergenza su Genset.

Il Leonardo PRO X rende facile ed immediato l'utilizzo di energia prodotta da moduli fotovoltaici, per l'alimentazione di utenze domestiche o isolate, con l'ausilio di un gruppo elettrogeno (back-up) in caso di ridotta energia rinnovabile. Collegando un gruppo elettrogeno all'ingresso AC input, il sistema garantisce la continuità di esercizio delle utenze senza percettibili discontinuità in caso di batteria scarica a causa della ridotta energia rinnovabile disponibile. Infatti, il gruppo elettrogeno gestisce simultaneamente l'alimentazione dei carichi e la carica del banco batterie.

È possibile abbinare al Leonardo PRO X la versione Slave, per espandere la potenza disponibile e/o per gestire impianti trifase. Disponibile in 2 versioni: 3000VA e 5000VA. I sistemi sono compatibili con i principali brand di batterie di accumulo al litio (tecnologia piombo con aggiunta WBM).

[eng]

Description

Leonardo PRO X together with WRM30+ external charge controllers can also be configured in off-grid mode (directly from the display) with emergency backup on Genset.

Leonardo PRO X makes it easy and immediate to use the energy produced by photovoltaic modules, to power domestic or isolated users, with the help of a generator (back-up) in the event of reduced renewable energy. By connecting a generator to the AC input, the system ensures continuity of operation of the utilities without perceptible discontinuity in the event of a low battery due to the reduced renewable energy available. In fact, the generator simultaneously manages the power supply of the loads and the charge of the battery bank.

It is possible to combine the Slave version with Leonardo PRO X, to expand the available power and / or to manage three-phase systems. Available in 2 versions: 3000VA and 5000VA. The systems are compatible with main brands of lithium storage batteries (lead technology with WBM addition).

[fra]

Description

Leonardo PRO X ainsi que les contrôleurs de charge externes WRM30+ peuvent également être configurés en mode hors réseau (directement à partir de l'écran) avec sauvegarde d'urgence sur le groupe électrogène.

Leonardo PRO X permet d'utiliser facilement et immédiatement l'énergie produite par les modules photovoltaïques, pour alimenter des utilisateurs domestiques ou isolés, à l'aide d'un générateur (back-up) en cas d'énergie renouvelable réduite. En connectant un générateur à l'entrée AC, le système assure la continuité de fonctionnement des services publics sans discontinuité perceptible en cas de batterie faible en raison de la réduction des énergies renouvelables disponibles. En effet, le générateur gère simultanément l'alimentation des charges et la charge du banc de batteries.

Il est possible de combiner la version Slave avec Leonardo PRO X, pour augmenter la puissance disponible et / ou pour gérer des systèmes triphasés. Disponible en 2 versions: 3000VA et 5000VA. Les systèmes sont compatibles avec les principales marques de batteries de stockage au lithium (technologie au plomb avec ajout WBM).

Caratteristiche prodotto



AC input for Genset bypass (switch <10ms)



Contact for automatic ignition of the Genset

[eng]

Product features



AC overload and short circuit protection



Monitoring and parameter setting directly from the display (or remote console App My Leonardo)

[fra]

Caractéristiques du produit



Remote control and integrated function management (to decrease on site operation maintenance)

Monitoring and control

Realtime

[eng]

[fra]

Attraverso la intuitiva visualizzazione Realtime, è possibile prendere visione, a seconda della tipologia di impianto installato, di tutti i parametri del sistema:

- Produzione fotovoltaica distinta in componenti retrofit e regolatori di carica
- Potenza immessa o prelevata dalla rete elettrica o prelevata dal gruppo elettrogeno
- Flusso di potenza in carica o scarica dalla batteria, e stato di carica della batteria.
- Potenza in tempo reale dei propri consumi.
- Report produzione/prelievo/consumi, giornaliero

Through the intuitive Realtime view, it is possible to visualize, depending on the type of system installed, all the system parameters:

- Photovoltaic production divided into retrofit components and charge controllers
- Power fed in or taken from the grid or taken from the genset
- Charging or discharging power flow from the battery, and battery charge status.
- Real-time power of consumption.
- Daily Report of production / withdrawal / consumption

Grâce à la vue intuitive en Realtime, il est possible de visualiser, selon le type de système installé, tous les paramètres du système:

- Production photovoltaïque divisée en composants de retrofit et contrôleurs de charge
- Puissance injectée ou prélevée sur le réseau ou prélevée sur le groupe électrogène
- Flux d'alimentation de charge ou de décharge de la batterie et état de charge de la batterie.
- Puissance de consommation en temps réel.
- Rapport quotidien de production / retrait / consommation:

Advanced

[eng]

[fra]

Nella sezione Advanced, l'utente ha la possibilità di monitorare l'andamento di tutte le grandezze che caratterizzano il proprio impianto.

Per tutti gli utenti:

- Bilancio in potenza del sistema
- Tensione, corrente e stato di carica batteria

Per installatori:

- Tensione, corrente di ciascuna stringa PV
- Tensione, corrente di ciascuna fase (per impianti trifase)

In the Advanced section, user has the ability to monitor the progress of all the quantities that characterize the system.

For all users:

- System power balance
- Voltage, current and battery charge status

For installers:

- Voltage, current of each PV string
- Voltage, current of each phase (for three-phase systems)

Dans la section Advanced, l'utilisateur a la possibilité de surveiller la progression de toutes les quantités qui caractérisent le système.

Pour tous les utilisateurs:

- Balance de puissance du système
- Tension, courant et état de charge de la batterie

Pour les installateurs:

- Tension, courant de chaque chaîne PV
- Tension, courant de chaque phase (pour les systèmes triphasés)

Notifications

[eng]

[fra]

Con le notifiche push (su app Android e iOS) ed e-mail, il cliente è costantemente aggiornato in caso di:

- batteria scarica
- blackout
- attivazione del gruppo elettrogeno
- sovraccarico del sistema.

With push notifications (on Android and iOS apps) and e-mail, customer is constantly updated in case of:

- low battery
- blackout
- activation of the generator
- system overload.

Avec les notifications push (sur les applications Android et iOS) et les e-mails, le client est constamment mis à jour en cas de:

- batterie faible
- panne du réseau
- activation du générateur
- surcharge du système.

Energy Rates

[eng]

[fra]

Grazie ai diagrammi energetici, è possibile conoscere il proprio report di produzione e consumo.

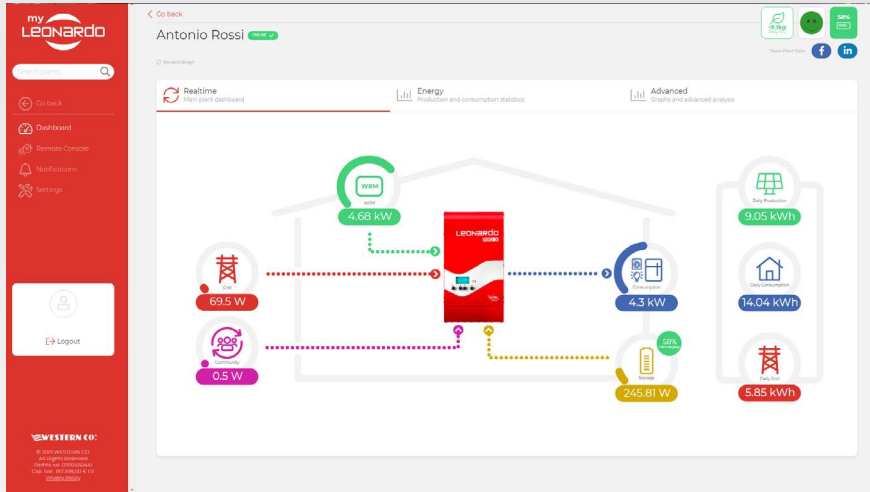
Sono disponibili filtri temporali, settimanali, mensili e annuali relativi ai dati di energia prodotta, consumata, immagazzinata in batteria, prelevata o immessa dalla rete elettrica.

Thanks to the energy diagrams, it is possible to know your own production and consumption report.

Time filters on weekly, monthly and annual basis are available relating to the data of energy produced, consumed, stored in the battery, taken or fed from the electricity grid.

Grâce aux diagrammes énergétiques, il est possible de connaître votre propre rapport de production et de consommation.

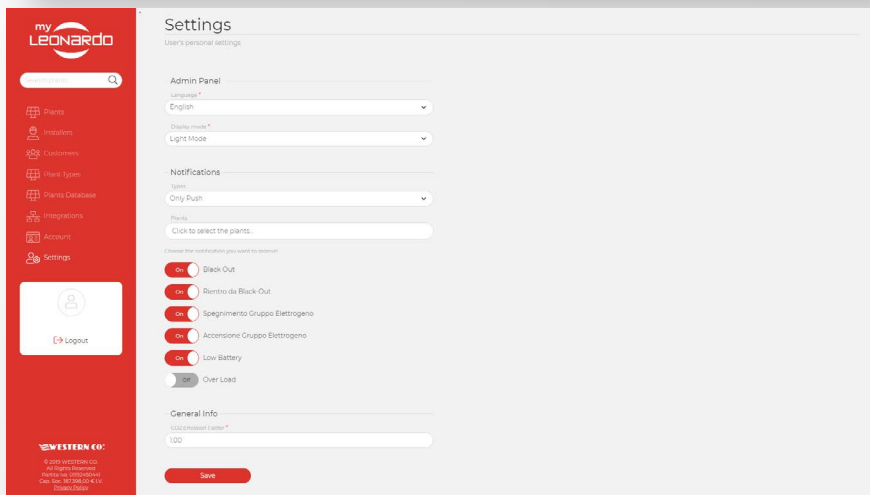
Des filtres horaires hebdomadaires, mensuels et annuels sont disponibles concernant les données d'énergie produite, consommée, stockée dans la batterie, prélevée ou alimentée sur le réseau électrique.



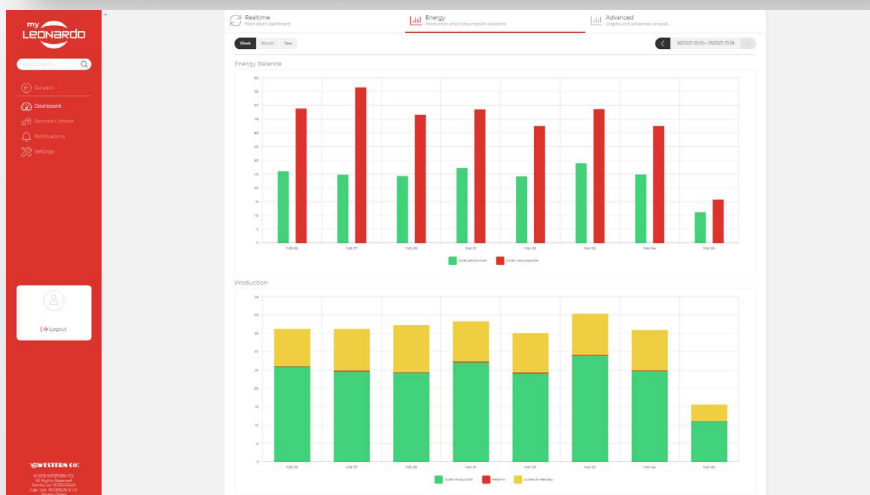
Realtime



Advanced



Notifications



Energy

Monitoring and control

[eng]

Attraverso l'app my Leonardo tutte le informazioni riguardo il proprio impianto di accumulo **Leonardo PRO X** sono a portata di mano in qualsiasi momento. L'app *my Leonardo* è disponibile per smartphone o tablet iOS e Android.

Through my Leonardo app, all information about your **Leonardo PRO X** storage system is at your fingertips at any time. *my Leonardo* app is available for iOS and Android smartphones or tablets.

[fra]

Grâce à my Leonardo app, toutes les informations sur votre système de stockage **Leonardo PRO X** sont à portée de main à tout moment. L'application *my Leonardo* est disponible pour les smartphones ou tablettes iOS et Android.

Download App:



APP
my Leonardo



[eng]

Grazie alla console remota non si è mai soli in caso di assistenza, modifica impostazioni operative e check-up dell'impianto.

Thanks to the remote console, you are never alone in the event of assistance, changing operational settings and system check-up.

[fra]

Grâce à la console à distance, vous n'êtes jamais seul en cas d'assistance, de modification des paramètres de fonctionnement et de vérification du système.



Batteries



Descrizione

Il **Leonardo PRO X** è compatibile con i principali brand di batterie di accumulo al litio.

[eng]

Description

Leonardo PRO X is compatible with main brands of lithium storage batteries.

[fra]

Description

Leonardo PRO X est compatible avec les principales marques de batteries de stockage au lithium.

Pylontech



| MODEL | CAPACITY |
|---------|----------|
| US2000C | 2.4kWh |
| US3000C | 3.5kWh |

US2000C/US3000C

Fino a 8 batterie parallelabili (on-grid) fino a 40 batterie parallelabili (off-grid)

[eng]

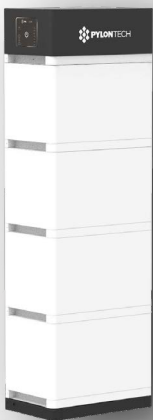
US2000C/US3000C

Up to 8 batteries in parallel (on-grid) up to 40 batteries in parallel (off-grid)

[fra]

US2000C/US3000C

Jusqu'à 8 batteries en parallèle (on-grid) jusqu'à 40 batteries en parallèle (off-grid)



| MODEL | CAPACITY |
|----------|----------|
| Force L2 | 3.5kWh |

[eng]

Force L2

Up to 7 batteries in parallel (on-grid) up to 35 batteries in parallel (off-grid)

[fra]

Force L2

Jusqu'à 7 batteries en parallèle (on-grid) jusqu'à 35 batteries en parallèle (off-grid)

Force L2

Fino a 7 batterie parallelabili (on-grid) fino a 35 batterie parallelabili (off-grid)

LG Chem



Permette di parallelare 2 batterie RESU LG Chem

| MODEL | CAPACITY |
|---------|----------|
| RESU3.3 | 3.3kWh |
| RESU6.5 | 6.5kWh |
| RESU10 | 9.8kWh |
| RESU13 | 13.1kWh |

[eng]

It allows to parallel 2 RESU LG Chem batteries

[fra]

Il permet de mettre en parallèle 2 batteries RESU LG Chem

Midac



| MODEL | CAPACITY |
|---------|----------|
| RES 4.2 | 4.2kWh |
| RES 5 | 5.1kWh |

Fino a 4 batterie parallelabili.

[eng]

Up to 4 batteries in parallel.

[fra]

Jusqu'à 4 batteries en parallèle.

Lead-acid batteries



Grazie al **WBM** le batterie al piombo diventano "smart".

Il WBM misura la corrente di batteria, la tensione di batteria e la temperatura. Implementa appositi controlli per gestire in modo oculato la batteria, massimizzando la sua vita utile.

I dati vengono così trasmessi al Leonardo PRO X e sono facilmente visualizzabili sia sul display integrato che sul portale web e app my Leonardo.

[eng]

Thanks to **WBM** lead-acid batteries become "smart".

The WBM measures battery current, battery voltage and temperature. Implement specific controls to manage the battery wisely, maximizing its useful life.

The data is thus transmitted to Leonardo PRO X and can be easily viewed both on the integrated display and on the web portal and my Leonardo app.

[fra]

Grâce à **WBM**, les batteries plomb-acide deviennent «intelligentes».

Le WBM mesure le courant, la tension et la température de la batterie. Mettez en œuvre des contrôles spécifiques pour gérer la batterie avec sagesse, maximisant sa durée de vie utile.

Les données sont ainsi transmises à Leonardo PRO X et peuvent être facilement visualisées à la fois sur l'écran intégré et sur le portail Web et my Leonardo app.

Charge controllers

Descrizione

Nel caso di installazione di nuovi impianti FV on-grid o impianti FV off-grid è necessario abbinare al Leonardo PRO X i regolatori di carica WRM30+ o WRM60 X SL. In questi casi, infatti, il sistema si collega in DC ai regolatori di carica esterni WRM30+ o WRM60 X SL.

[eng]

Description

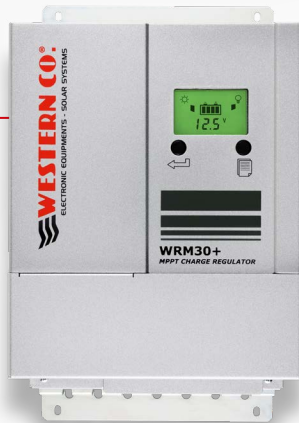
In case of installation of new on-grid PV systems or off-grid PV systems, it is necessary to combine Leonardo PRO X with WRM30+ or WRM60 X SL charge controllers. In these cases, in fact, the system is connected in DC to the external charge controllers WRM30+ or WRM60 X SL.

[fra]

Description

En cas d'installation de nouveaux systèmes PV sur réseau ou de systèmes PV hors réseau, il est nécessaire de combiner Leonardo PRO X avec des régulateurs de charge WRM30+ or WRM60 X SL. Dans ces cas, en effet, le système est connecté en DC aux contrôleurs de charge externes WRM30+ or WRM60 X SL.

WRM30+



WRM60 X SL



Special design

Solo su richiesta

Only on request

Uniquement sur demande



Inverter

Charge controller

Battery

Caratteristiche prodotto



2 Independent MPPT PV inputs

[eng]

Product features



WBUS protocol with RS485 communication port

[fra]

Caractéristiques du produit



Protections:
Low voltage load disconnect
Over-temperature
Battery polarity inversion
Output overload protection

Caratteristiche elettriche

[eng]

Electrical specifications

[fra]

Fonctionnalités électroniques

| | | WRM30+ | | | WRM60 X SL | | |
|--------------------------------------|-------------|-------------------|-------|-------|--------------|-------|-------|
| | | Min | Typ | Max | Min | Typ | Max |
| Battery voltage | V_{batt} | 40.0V | 48.0V | 64.0V | 40.0V | 48.0V | 64.0V |
| Max PV open circuit voltage | V_{pan} | - | - | 180V | - | - | 180V |
| Max PV current for each MPPT channel | I_{pan} | - | - | 13A | - | - | 26A |
| Max PV power for each channel | P_{chMax} | - | - | 900W | - | - | 1800W |
| Battery charge current | I_{ch} | - | - | 30A | - | - | 30A |
| Self-consumption | I_q | - | 12mA | - | - | 15mA | - |
| Operating temperature | T_{amb} | -40°C | - | +50°C | -40°C | - | +50°C |
| Max power loss | P_{loss} | - | - | 66W | - | - | 130W |
| Efficiency | η | 96.0% | - | 97.2% | 96.0% | - | 97.2% |
| Battery wires / connections | | 35mm ² | | | M8 screws | | |
| PV module wires / connections | | 10mm ² | | | MC4 | | |
| Protection degree | | IP20 | | | IP20 | | |
| Weight | | 1.1kg | | | 2.2kg | | |
| Dimensions | | 178x283x84mm | | | 260x290x80mm | | |

Electrical specifications

| | | | Leonardo PRO X 3000/48 Li | Leonardo PRO X 5000/48 Li |
|-----------------------------------|--|-------------------------------------|-------------------------------------|--------------------------------|
| INVERTER | Nominal power | Pnom | 3kVA | 5kVA |
| | Continuous power at 25 ° C | Pcon1 | 2.4kW | 4.0kW |
| | Continuous power at 40 ° C | Pcon2 | 2.2kW | 3.7kW |
| | Battery voltage | Vbat | 48V | 48V |
| | Battery voltage range | Vdc | 40 – 66V | 40 – 66V |
| | AC voltage and frequency | Vnom | 230Vac – 50Hz | 230Vac – 50Hz |
| | AC voltage range | Vac | 187 – 265Vac | 187 – 265Vac |
| | AC input current | Iac | 32A | 50A |
| | Harmonic distortion | Thd | < 3% | < 3% |
| | Nominal power factor | Pi | 1 | 1 |
| | Min. load Maximum efficiency DC-> AC | Eds | 95% | 96% |
| | Max. load Maximum efficiency DC-> AC | | 80% | 80% |
| | Connectable load power on EPS out | Eps | 2.4kW | 4.0kW |
| | EPS transfer time on grid blackout | Tsw | 10ms | 10ms |
| | Power consumption in by-pass mode | Pbp | < 2W | < 2W |
| | Topology | Top | Toroidal isolation transformer | Toroidal isolation transformer |
| | Cooling | Ven | Forced ventilation | Forced ventilation |
| | PV production meter | Mis | 40A with direct connection | 40A with direct connection |
| Consumption current sensor | Ta | 100A split core current transformer | 100A split core current transformer | |
| AC CHARGER | Maximum charge power | Pch | 2.1kW | 3.5kW |
| | Maximum charge current | Ich | 35A | 70A |
| | Maximum efficiency AC-> DC | Ech | 95% | 95% |
| | Charging curve | Alg | BMS self-adaptive | BMS self-adaptive |
| | Battery communication | Com | CAN BUS | CAN BUS |
| INTERFACES | PV production meter connection | Meter | 2 x 2.5mm2 screw terminals | 2 x 2.5mm2 screw terminals |
| | VE-Bus Master/Slave port | VE-Bus | RJ45 | RJ45 |
| | WBUS service port | WBUS | RJ11 | RJ11 |
| | Battery communication port | CAN | RJ10 with 1.5m supplied cable | RJ10 with 1.5m supplied cable |
| | Internet communication port | Ethernet | RJ45 | RJ45 |
| | Current sensor port | Current Sense | 3.5mm jack with 1m cable | 3.5mm jack with 1m cable |