KOMADA®

T-SERIES 2-WAY PALLET RADIO SHUTTLE PRODUCT BROCHURE

TTF MARKETING HOLDINGS SDN. BHD.

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Brief Introduction

TTF MARKETING HOLDINGS SDN. BHD. is a leading Racking Systems and Office Systems pioneer in Malaysia. In order to achieve world class standard of quality, we heavily invest into modern machineries and latest sophisticated technology.

Our full range product such as Light Duty Racking Systems, Medium Duty Racking Systems, Heavy Duty Racking Systems, Steel Platform, Mezzanine Floor, Selective Pallet Racking, Automated Storage & Retrieval System, Gondola Shelving and Office Systems to all the market segment such as industrial, warehouse, office, retail, hypermarket and residential use. With our dynamic strength and full coordination, TTF GROUP also introduce another added products named KOMADA Material Handling Equipment, SAFER Stainless Steel Convex Mirror, IRON MAN Pallet Mesh, SHUTER MAN Aluminium Ladder and FiTO Office Systems.

Our quality standard awarded ISO 9001 authentication certificate. We are confident that with our expertise, latest technology, research and development, we can fulfil our customer needs and requirement to continually improve the effectiveness of Quality Management Systems.

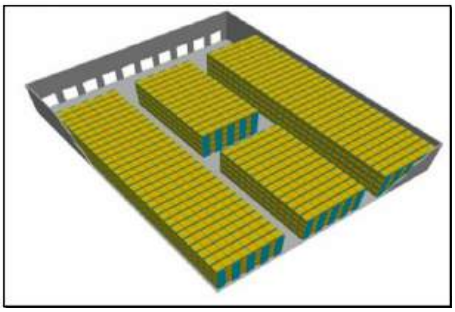
II. Shuttle Rack Advantages

For the original drive-in rack, many forklift work channels must be reserved for forklift to place cargo on to rack by directly entering warehouse area. This mode has a big disadvantage, i.e.wasting time and energy, which seriously affects the management efficiency in the warehouse. Now it is changed to shuttle rack, in which forklift only works in front end of warehouse, and cargo is transported to the designated location through pallet radio shuttle. What pallet radio shuttle transfers between various channels is completed by forklift. This program largely improves work efficiency, which has achieved results of swift and safety.

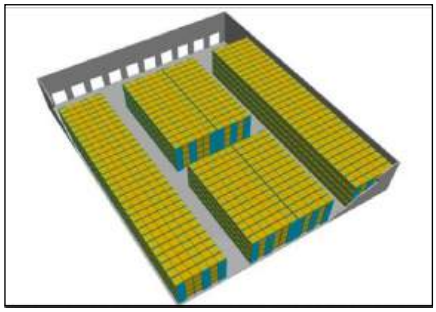
Advantage details are as follows :

1. Forklift is unnecessary for entering aisle, which can save operating time and improve security of both personnel and cargo.
2. Warehouse space is fully utilized so that availability in warehouse can be more than 80%.
3. Different kinds of products can be flexibly accessed in rails.
4. Structural stability makes higher safety factor in comparison with drive-in rack.
5. FIFO (First-In, First-Out) and FILO (First-In, Last-Out) can be realized;
6. Be suitable for cargo with more quantity and less variety, such as food, beverage, chemical, medicine and tobacco industries with single variety and more batches, especially in cold storage environment.

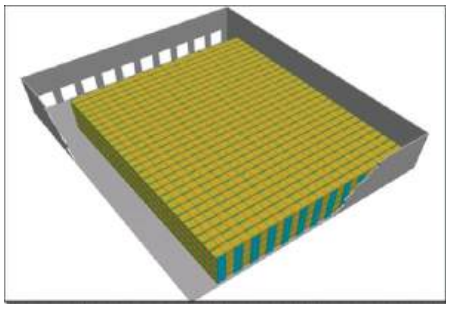
i.e. Contrast figure sofware house system: (2600 pallets)



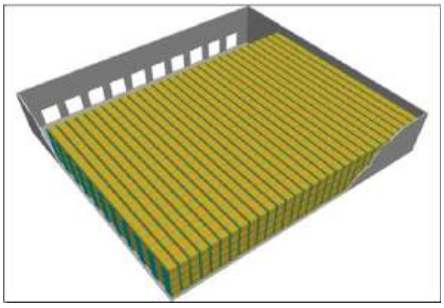
Drive-in rack with 9 deep locations



Push-back rack with 5-6 deep locations



Pallet flow rack with 25 deep locations



Shuttle rack with 22 deep locations

Total expenses: Land fork and staff figure

The above comparison clearly shows that shuttle rack has absolute advantage in whole expenses! Therefore it is also future selection for customer!

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III. Product Introduction

1. Classifications

Parameters		Economic type	Standard type	Advanced type
Outline				
Loading capcity max.		Max.1500kg	Max.1500kg	Max.1500kg
Move	Running speed	*V max* (empty)：1.0m/s *V max* (full)：0.8m/s	*V max* (empty)：1.0m/s *V max* (full)：0.8m/s	*V max* (empty)：1.5m/s *V max* (full)：1.0m/s
	Drive motor	Domestic brush servo motor 48VDC 600W	Domestic brushless servo motor 48VDC 600W	Imported brushless servo motor 48VDC 600W
	Servo driver	Domestic customized servo driver	Domestic customized servo driver	Domestic customized servo driver
Lift	Lift motor	Imported motor 48VDC 500W	Imported motor 48VDC 500W	Imported motor 48VDC 500W
	Lift height	≤ 45mm	≤ 45mm	≤ 45mm
Move positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Pallet positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Lift control proximity switch		Germany P+F	Germany P+F	Germany P+F
Object detection photo sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Control system		Siemens S7-200PLC	Siemens S7-200PLC	Siemens S7-200PLC
Remoter : two-way		Customized IMT	Customized IMT	Customized IMT
Power supply		Lithium battery	Lithium battery	Lithium battery
Battery capacity		48V, 30AH	48V, 30AH	48V, 30AH
Running time		≥ 8h	≥ 8h	≥ 8h
Charging time		3 ~ 4H	3 ~ 4H	3 ~ 4H
Battery lifetime		Charge times ≤ 1000	Charge times ≤ 1000	Charge times ≤ 1000
Operation mode		Remote control	Remote control	Remote control
Running noise		≤ 60dB	≤ 60dB	≤ 60db
Painting color		Frame (black) others (light gray)	Frame (black) others (light gray)	Frame (red) others (light gray)
Ambient temperature		Temp: 0º ~ 50º Humidity: 5% ~ 95%	Temp: 0º ~ 50º Humidity: 5% ~ 95%	Temp: 0º ~ 50º Humidity: 5% ~ 95%

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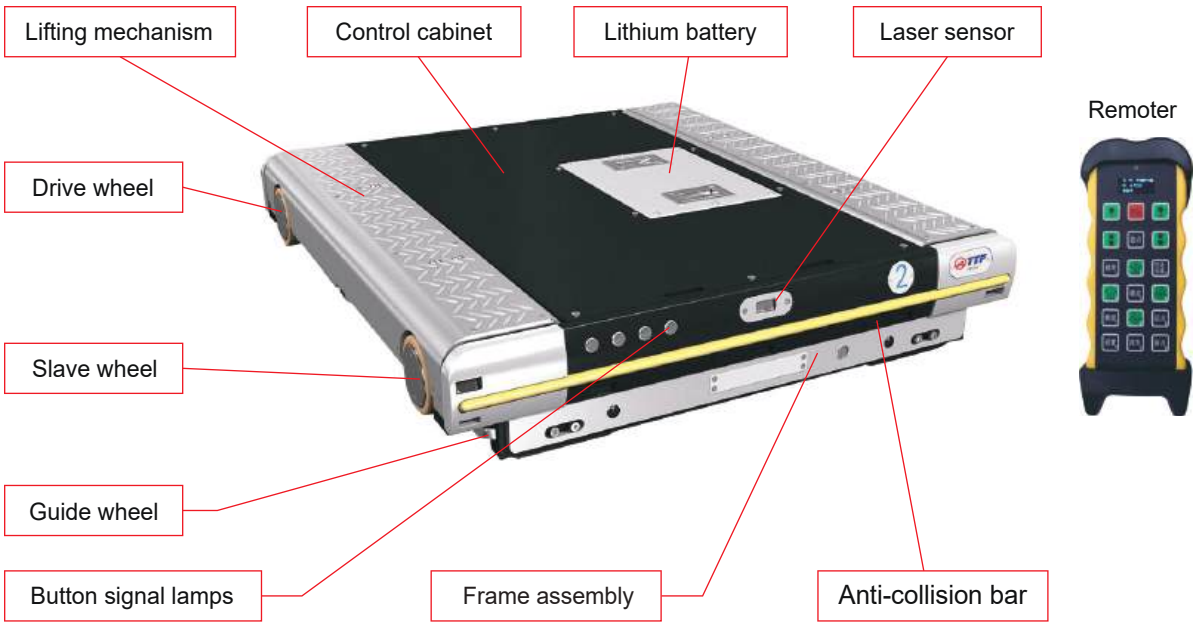
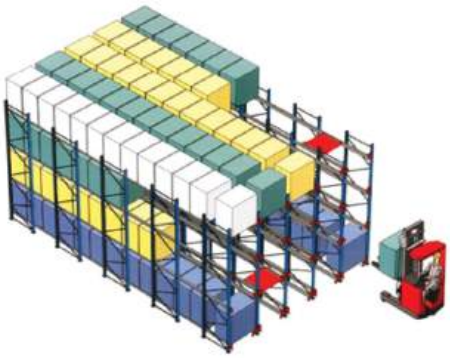
Parameter		Heavy Load Type	Low Temperature Type	WIFI Type
Outline				
Maximum payload		Max 2000kg	Max 1500kg	Max 1500kg
Move	Running speed	*V max* (empty)：0.8m/s *V max* (full)：0.6m/s	*V max* (empty)：1.0m/s *V max* (full)：0.8m/s	*V max* (empty)：1.5m/s *V max* (full)：1.0m/s
	Drive motor	Domestic brush motor 48VDC 800W	Imported brush servo motor 48VDC 600W	Imported brushless servo motor 48VDC 600W
	Servo driver	Domestic customized servo driver	Domestic customized servo driver	Imported brushless servo driver
Lift	Lift motor	Domestic motor 48VDC 540W	Imported motor 48VDC 500W	Imported motor 48VDC 500W
	Lift height	≤ 45mm	≤ 45mm	≤ 45mm
Move positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Pallet positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Lift control proximity switch		Germany P+F	Germany P+F	Germany P+F
Object detection photo sensor		Germany P+F/SICK	Germany P+F/SICK	Germany P+F/SICK
Control system		Siemens S7-200PLC	Siemens S7-1200PLC	Siemens S7-1200PLC
Remoter : two way		Customized IMT	Customized IMT	Customized IMT
Power supply		Lithium battery	Lithium battery	Lithium battery
Battery parameter		48V, 40AH	48V, 40AH	48V, 40AH
Runtime		≥ 8h	≥ 8h	≥ 8h
Charging time		3~4H	3~4H	3~4H
Battery lifetime		Charge times ≤ 1000	Charge times ≤ 1000	Charge times ≤ 1000
Operation mode		Remote control	Remote control	WCS dispatch / Remote control
Running noise		≤ 60dB	≤ 60dB	≤ 60dB
Painting		Frame (black) others (light gray)	Frame (black) others (light gray)	Frame (red) others (light gray)
Ambient temperature		Temp: 0º ~ 50º Humidity: 5% ~ 95%	Temp: -25º ~ 50º Humidity: 5% ~ 95%	Temp: 0º ~ 50º Humidity: 5% ~ 95%

Parameter		Stacker Type	M/S Type
Outline			
Maximum loading		Max 1500kg	Max 1500kg
Move	Running speed	*V max* (empty)：1.5m/s *V max* (full)：1.0m/s	*V max* (empty)：1.0m/s *V max* (full)：0.8m/s
	Drive motor	Imported brushless servo motor 48VDC 600W	Imported brushless servo motor 48VDC 600W
	Servo driver	Imported brushless servo driver	Imported brushless servo driver
Lift	Lift motor	Imported motor 48VDC 500W	Imported motor 48VDC 500W
	Lift height	≤ 45mm	≤ 45mm
Move positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK
Pallet positioning Laser sensor		Germany P+F/SICK	Germany P+F/SICK
Lift control proximity switch		Germany P+F	Germany P+F
Object detection photo sensor		Germany P+F/SICK	Germany P+F/SICK
Control system		Siemens S7-1200PLC	Siemens S7-1200PLC
Remoter: spare		Spare domestic	Spare domestic
Power supply		Lithium battery	Lithium battery
Battery parameter		48V, 30AH	48V, 30AH
Run time		≥ 8h	≥ 8h
Charging time		3~4H	3~4H
Battery lifetime		Charge times ≤ 1000	Charge times ≤ 1000
Operation mode		WCS dispatch / Remote control	WCS dispatch / Remote control
Running noise		≤ 60dB	≤ 60dB
Painting		Frame (red) others (light gray)	Frame (black) others (light gray)
Ambient temperature		Temp: -25º ~ 50º Humidity: 5% ~ 95%	Temp: 0º ~ 50º Humidity: 5% ~ 95%

2. Structure Composition



3. Standard Operation



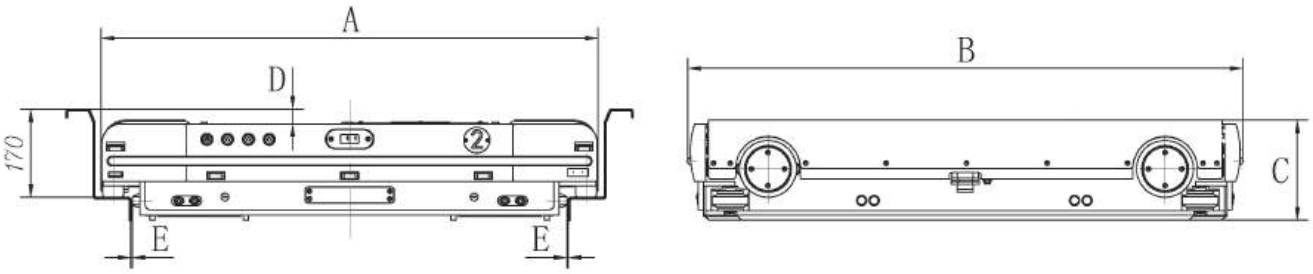
FILO

FIFO

(1) IN (2) OUT (3) CONT. IN (4) CONT. OUT
(5) DESIG. OUT (6) SHIFT (7) DESIG. SHIFT (8) COUNT
(9) IN COUNT (10) RESTORE (11) A/B

4. Outline Dimensions and Weight

Model	Pallet sizes (mm)	Weight (kg)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
TDRII-1012	1000X1200	285	831	1270	193	27	3
TDRII-1113	1100X1300	295	873	1370	193	27	3
TDRII-1210	1200X1000	280	957	1070	193	27	3
TDRII-1211	1200X1100	290	957	1170	193	27	3
TDRII-1212	1200X1200	300	957	1270	193	27	3
TDRII-1213	1200X1300	310	957	1370	193	27	3
TDRII-1214	1200X1400	320	957	1470	193	27	3
TDRII-1215	1200X1500	335	957	1570	193	27	3
TDRII-1216	1200X1600	345	957	1670	193	27	3
TDRII-1311	1300X1100	300	1057	1170	193	27	3
TDRII-1410	1400X1000	310	1157	1070	193	27	3
TDRII-1411	1400X1100	320	1157	1170	193	27	3
TDRII-1412	1400X1200	330	1157	1270	193	27	3
TDRII-1414	1400X1400	355	1157	1470	193	27	3
TDRII-1415	1400X1500	365	1157	1570	193	27	3



Note:

1. Different dimensions of pallet radio shuttle can be tailor-made as per various kinds of pallets and rails.
2. Pallet sizes i.e.1200 X 1000（front number 1200 means fork-in direction/ width direction rear number 100 means width direction).

5. Product Advantages

1) More Higher Technical Capacity

- TDRII-A Shuttle Speed : V *empty* = 1.5m/s and V *full* = 1.0m/s. (Global lead)
- TDRII-B Shuttle Carrying Capacity : 1.5 Tons. (Global lead)
- TDRII-T Shuttle Carrying Capacity : 2.0 Tons. (Global lead)
- Efficiency : Approximately 1.5 to 2 times faster than other counterparts.
- Rapidity and Stability : Realize both rapidity and stability.

2) More Higher Compatibility and Stability

- Suitable for different warehouse: Normal temperature, low temperature, cool and corrosion warehouse.
- Suitable for different pallets: Wooden pallet, plastic pallet, steel pallet, thin edge pallet, dark pallet, and incomplete pallet etc.

Compatible with big and small pallets.

Steel pallet

Wooden pallet

Plastic pallet

- System is anti-interference designed. Detection signal adopts special detecting mode, and instantaneous interference signal is shielded.
- Imported customized remote control is adopted,which is stable and reliable and has far transmission distance, high IP class.
- German laser detection is adopted, which is not affected by environment and has accurate and reliable detection.
- Lithium battery is safe and reliable and has long life time.
- Japan bearing, joint bearing with military quality,high-grade screw and special mounting technology to ensure not loose for longtime.
- Guide wheel has locking mechanism,which does not need to be adjusted for three years.
- Each process considers all possibilities to ensure that order can be executed in any case.

3) More Intelligence

- **Intelligent in-stock design:** Cargo on the in-stock end can be recognized within one meter no matter where cargo locates or what status shuttle is, and also can recognize the crush of cargo.

- **Intelligent out-stock design:** Out-stock has two modes, first when no cargo is detected on out-stock end the “OUT” can be executed, but in another mode out-stock is one by one successively. During out-stock, location can be automatically regulated if inaccurate pallet location is found. Cargo out-stock with designated quantity can be realized, and the quantity still can be kept in case of power failure.

- **Intelligent shifting-stock design:** Two kinds of shifting-stock functions such as FIFO (First-in, First-Out) and FILO (First-in, Last-Out) can be realized by remote control. When shifting-stock action is interrupted, one button to continue shifting-stock.

- **COUNT function:** TDRII-B has COUNT function, which is real-time indicated by remote control. It is convenient to count up product quantity in each lane way and continuous count is supported.

- **Parameter standardization design:** Various parameters are setup by remote control to match various applications so that such applications become more flexible.

- **More convenient operation:** Customized remote control, Chinese or English operation panel, status prompt and alarm prompt in English make operation simplified.

- **Swift maintenance:** Operator can acquire status and alarm message of shuttle in English through remote control, and get trouble eliminating method by looking up maintenance manual or contact manufacturer for solution.

4) **Enhanced Safety Features**

- **Self-inspection function of component:** Once component has fault or damage, equipment can make self-inspection and send alarm prompt.

- **Collision protection:** Equipment is equipped with obstacle avoidance sensor to timely send alarm for emergent stop in case of obstacle, which can play a role of collision protection and shield the false alarm for forklift detected on the end of shuttle carrier.

- **Light cargo falling prevention:** Use hardware and software two kinds of protection to ensure the cargo not falling.

- **Forced running function:** Once dust affects laser detection, equipment can be moved to the end through forced running function, which does not need rescue vehicle.

- **Alllow temperature design:** By means of low temperature resistance design with moisture proof function and without heating device, system can normally work under low temperature of -25˚C and reliability like normal temperature shuttle.

- **Feed protection function:** When low battery, pallet shuttle executes the current action, then return to “HOME” position for alarm. No more accept instructions

- **Laser is equipped with protective board:** to avoid laser damage or angle deviation due to mis-operation by forklift operator.

6. Pallet Radio Shuttle Affiliated Equipments

1) Rescue Equipment

Rescue vehicle of pallet radio shuttle is an equipment to drag pallet radio shuttle to cargo rack port when pallet radio shuttle can not move on rack due to trouble. Manual mode is adopted to make forward or backward with handle. Operating method is as follows: First of all, rescue vehicle is forked to pallet radio shuttle rail by forklift, then operator moves rescue vehicle to the faulty pallet radio shuttle.

Firstly switch off main power supply of pallet radio shuttle, then connect pallet radio shuttle with rescue vehicle by hook. Then move them to cargo rack port by manual handle. Remove hook, then fork out rescue vehicle and pallet radio shuttle separately.

2) Charging Cabinet

Charging cabinet, an equipment to charge battery of pallet radio shuttle, has two charging positions. Charging position circuit is designed with independent power supply, which can charge two batteries simultaneously or charge one battery together. Charging will automatically stop when battery is fully charged. Charging cabinet has simple operation and convenient application.

3) Auxiliary Placement System

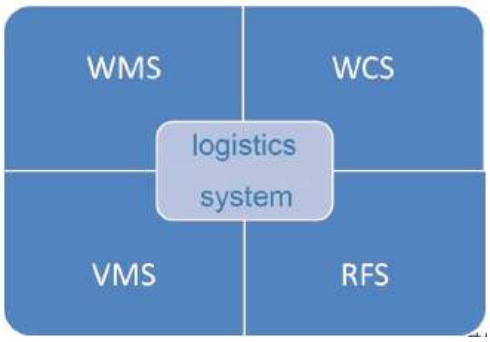
When working on higher rack, forklift operator often drop off pallet radio shuttle due to insufficient sight or less experience. In order to solve this problem, our company has developed a set of auxiliary placement system for pallet radio shuttle, which can provide forklift with visual interface to prevent pallet radio shuttle from dropping off by mis-operation.

4) **Auxiliary Rescue System**

When pallet radio shuttle rescued with rescue vehicle, pallet radio shuttle with cargo is hardly dragged out if pallet radio shuttle is in heavy duty. By means of this auxiliary system, pallet can be firstly placed on rail, then pallet radio shuttle directly dragged out!

7. **WMS and WCS Introduction**

WMS is the acronym of Warehouse Management System. It is a management system for comprehensive use of batch management, material matching, inventory verification, quality control management, virtual warehouse management, JIT inventory management and other functions through warehouse-in business, warehouse-out business,warehouse allocation, inventory movement, virtual warehouse management, and other functions so as to effectively control and track logistics of warehouse business and the whole process of cost management and to realize or improve corporate warehouse information management.



WCS which is the bridge between WMS and logistics equipment is responsible for coordinating and dispatching logistics equipment in bottom layer so as to enable logistics equipment in bottom layer to implement business process of warehouse system. Moreover, the whole process is executed according to preset process of the program.

VI. Project Cases

U.S.A Project


India Project


Coca-cola project


Japan Goo.N Diaper Project

Sinopec Project

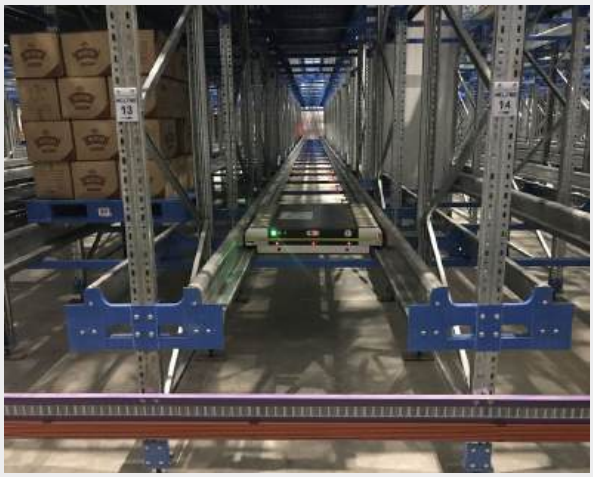
Malaysia Project

LiaoNing Stacker Project（Fork type）

Xiamen Stacker Project（Chaintype）

Henan Stacker Project（Super Lithuim Capacitance）

Hunan Stacker Project（low temp.version fork type）



Tianjin Stacker Project（forktype）

FAW Automative Project

C’estbon project

Yili Group project

Arawana Grease Project

Pharmaceutical Glass Project


Eastroc Beverage

Gree Electric Appliances


Yihai Kerry

Cold Chain

Castrol

Oriental Yuhong

Sinopharm

KOMADA®

T-SERIES 2 WAY PALLET RADIO SHUTTLE

SMART | EFFICIENT | RELIABLE

Engineered to redefine modern warehousing with precision and intelligence.