

Introduction

The Q-Free® MultiReader MD 5850 is a stand alone 5.8 GHz DSRC Transceiver designed for Automatic registration, identification and debiting of vehicles carrying the MD read / write microwave communication transponder. MD 5850 is designed to meet all standards related to Road Transportation Telematics (RTT)

Features

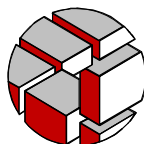
- Compact Small size unit
- Stand alone unit communicating with both complex (MDR) and low complexity (LDR) transponders.
- Standardised Interface for Ethernet (10base) connection (Coax, Fibre or twisted pair of copper wire).
- Standardised interface for RS422
- Self Diagnostic functions
- Buffer for 10000 transactions
- Power connection 12, 24 or 48 VDC
- Over-voltage protection circuitry
- Four (4) Microwave communication Channels
- Identifies vehicles driving faster than 200km/h
- Multi-Application support

Description

- The Q-Free® MultiReader MD 5850 is suited for several different applications like Road Tolling, Automatic Fee Collection , Access Control and car park management.
- The MultiReader can be connected directly to a Toll Plaza Computer (TPC) or a Lane Controller (LC) or for long distances via a HUB.
- The MultiReader is mounted on a gantry over the lane or under the toll plaza superstructure.



- A special made mounting bracket for easy adjustment can be provided.
- The unit contains a 5.8 GHz microwave radio (transmitter and receiver), an advanced data modem, CPU board and a power supply unit.
- The MultiReader communicates with its environment through Ethernet or serial lines. The connection cable carries all necessary signals and power.
- The MultiReader is also equipped with a separate configuration port for connecting a PC.
- The unit is designed to work under tough environmental conditions. Accessories like a heat protection shield with an extra fan can be provided if necessary.
- The unit is in accordance with CE specifications.
- The unit is type approved according to EN 300 674. Type approval no. NO97000446-R.

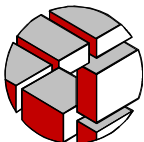


Q-FREE® Systems

Technical Specification



Operating Frequency.	: 5.7975 GHz (Channel 1)
	: 5.8025 GHz (Channel 2)
	: 5.8075 GHz (Channel 3)
	: 5.8125 GHz (Channel 4)
Communication:	
Down-link mod for MDR1/MDR2 (1.5 / 2.0 MHz)	: 500 kbps (Standard DSRC)
Down-link mod for LDR	: 31.25 kbps
Up-link modulation for MDR1, MDR2 and LDR	: 250 kbps MDR (Standard DSRC) and 31.25 kbps LDR
Type of Communication.	: Half duplex, read/write function.
Max Communication range with secure data com.	: 10 meters
Antenna Power gain	: 19dB
Beam-width horizontal:	: 17°
Beam-width vertical	: 10°
Power supply:	: 12V, 24V or 48V DC (Specify on order)
Power Consumption	: < 50 watt
Radiated power (EIRP)	: 33 dBm, 2 watt
Network for data communication.	: Ethernet (10 base-T, coax or fibre)
Serial Data communication	: RS422
Serial Terminal configuration (short range)	: RS232
Processor system.	: MVME 162
Microwave and Base Band system	: Q-Free part no. 024A0MR1 or 024A0MR4



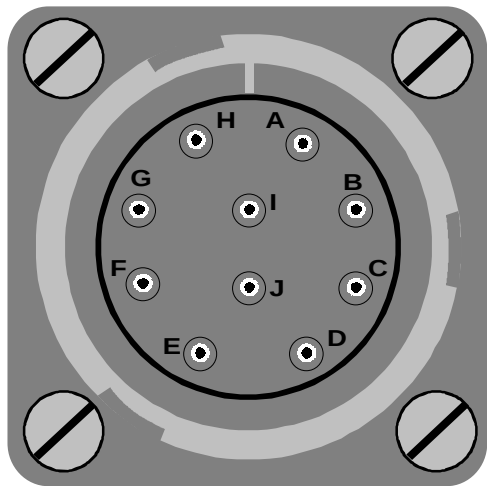
Q-FREE® Systems

Interface Specifications

Cable connection Interface to MD-5850

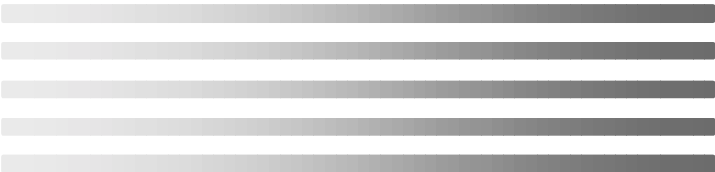
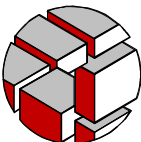
Standard Cable connector	: 10 pin circular connector with bayonet lock
Optional Cable Connector	: Han-Modular with 4 modules
Standard Cable for Data (RS422 or 10Mbit Ethernet)	: Total 2 twisted pairs with outer screen (Max 150 m)
Optional (1) Cable for Data through 10Mbit Ethernet	: 2 optical fibres.(Max 2 km)
Optional (2) Cable for Data through 10Mbit Ethernet	: 2 coax cables (Max 150 m)
Standard power 24 V	: 3 wires 0.8 mm ² (Max 150m) for +/- V DC
Optional power 12 V	: 3 wires 0.8 mm ² (Max 10m) for +/- V DC
Data signals com 1 (RS232)	: 2 pair 0,5 mm ² (Max 10 meters)

Signal configuration for the standard 10 pin circular Chassis Connector with bayonet lock



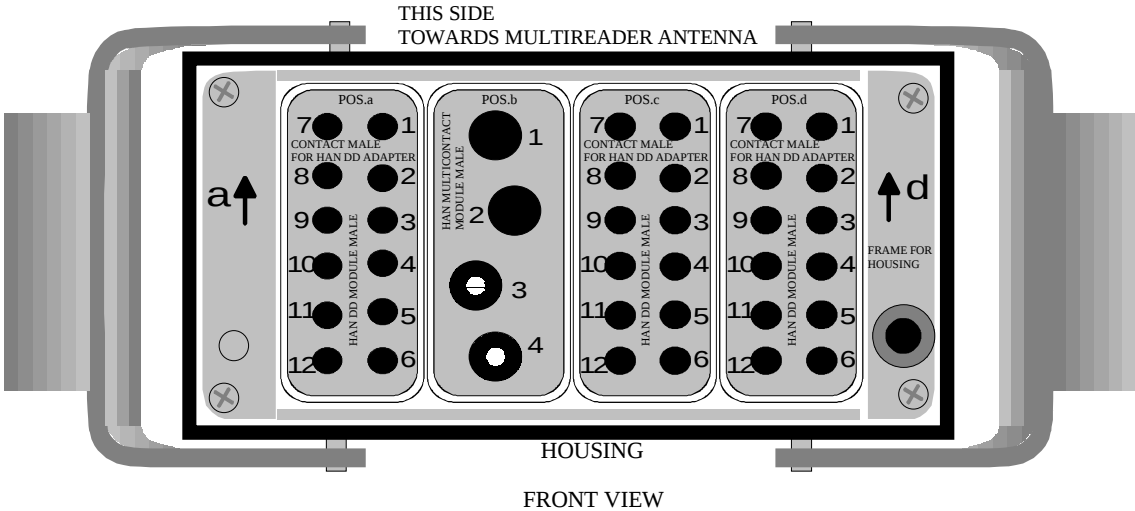
POWER SUPPLY & DATA

PIN A	+VDC
PIN B	+VDC
PIN C	-VDC
PIN D	-VDC
PIN E	-RX
PIN F	+RX
PIN G	-TX
PIN H	+TX
PIN I	+VDC
PIN J	-VDC



Interface Specifications

Signal configuration for the optional Han-Modular Connector (All Options)



POS. a POWER SUPPLY

PIN 1	+48 VDC	Option
PIN 2	+48 VDC	Option
PIN 3	+48 VDC	Option
PIN 4	+12 VDC	Option
PIN 5	+12 VDC	Option
PIN 6	+12 VDC	Option
PIN 7	+24 VDC	Standard
PIN 8	+24 VDC	Standard
PIN 9	+24 VDC	Standard
PIN 10	- IVDC	Standard
PIN 11	- IVDC	Standard
PIN 12	- IVDC	Standard

POS. b FIBRE OPTIC & COAXIAL Eth.net

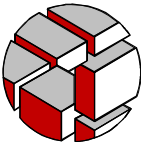
PIN 1	TX FIBRE
PIN 2	RX FIBRE
PIN 3	TX/RX COAXIAL 1
PIN 4	TX/RX COAXIAL 2

POS. c RS232/RS422/Eth.net twisted pair

PIN 1	+IERX (Eth.net tw. pair)
PIN 2	+IETX (Eth.net tw. pair)
PIN 3	ITXD (RS232)
PIN 4	+ITX (RS422)
PIN 5	NC
PIN 6	+IRX (RS422)
PIN 7	- IERX (Eth.net tw. pair)
PIN 8	- IETX (Eth.net tw. pair)
PIN 9	IRSGND (RS232)
PIN 10	- ITX (RS422)
PIN 11	IRXD (RS232)
PIN 12	- IRX (RS422)

POS. d PIO Signals

PIN 1	IOA1	VDC signals
PIN 2	IOB1	from/to
PIN 3	IOA2	a PIO board
PIN 4	IOB2	relé switch.
PIN 5	IOA3	
PIN 6	IOB3	
PIN 7	IOA4	
PIN 8	IOB4	
PIN 9	IOA5	
PIN 10	IOB5	
PIN 11	IOA6	
PIN 12	IOB6	



Connector Specifications

Harting Connector assembly parts

Identification

Cable Clamp EMC (IP68):
Hood (standard):
Han DD Module Male:
Han DD Module Female:
Han Multicontact-Module Male
Han Multicontact-Module Female
Contact Female 0.5mm Silver P.
Contact Female 1.0mm Silver P.
Contact Female 2.5mm Silver P.
Frame for hood:
Frame for Housing:
Housing (standard):
Contact Male for Han DD PCB adapter
Dummy module:
Han PCB Adapter
FOC male contacts for fibre
FOC female contact for fibre

MD Part No.

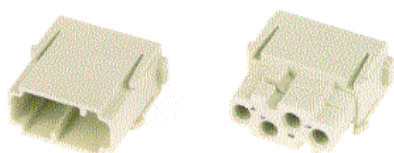
2A1MCC01
2A1MHD01
2A1MDD01
2A1MDD02
2A1MMM01
2A1MMM02
2A1MS 001
2A1MS 002
2A1MS 003
2A1MFH01
2A1MFS 01
2A1MHS 01
2A1MS 004
2A1MDM01
2A1MAD01
2A1MFC01
2A1MFC02

Harting Part No.

09 62 000 5008
09 30 016 0520
09 14 012 3001
09 14 012 3101
09 14 004 4501
09 14 004 4512
09 15 000 6203
09 15 000 6202
09 15 000 6206
09 14 016 0301
09 14 016 0311
09 30 016 0301
09 15 000 6191
09 14 000 9950
09 16 000 9905
20 10 125 4211
20 10 125 4221

Mounting part

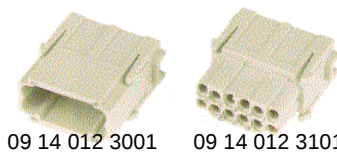
Cable
Cable
Chassis
Cable
Chassis
Cable
Cable
Cable
Cable
Chassis
Chassis
Chassis
Cable & Chassis
PCB I/O Filter
Cable External
Cable Internal



Male 09 14 004 4501 Female 09 14 004 4512



09 14 000 9950



09 14 012 3001

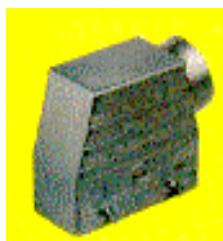
09 14 012 3101



Male 09 14 000 6111

Female 09 14 000 6211

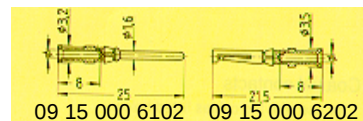
Coaxial contacts 50 ohm



09 30 016 0520

Four module frame

09 14 016 0311



09 15 000 6102

09 15 000 6202



Male 20 10 125 4211

Female 20 10 125 4221

Fibre contacts for DIN 41 626 part 3



09 30 016 0301

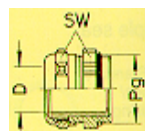


09 14 016 0301

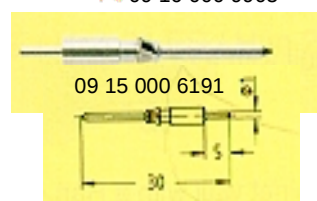
Wire gauge		ø	Stripping length
0.14-0.37 mm ²	AWG 26-22	0.90 mm	8 mm
0.5 mm ²	AWG 20	1.10 mm	8 mm
0.75 mm ²	AWG 18	1.30 mm	8 mm
1 mm ²	AWG 18	1.45 mm	8 mm
1.5 mm ²	AWG 16	1.75 mm	8 mm
2.5 mm ²	AWG 14	2.25 mm	6 mm



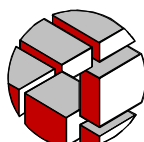
09 16 000 9905



09 62 000 5008



09 15 000 6191



Q-FREE® Systems

Physical Dimensions

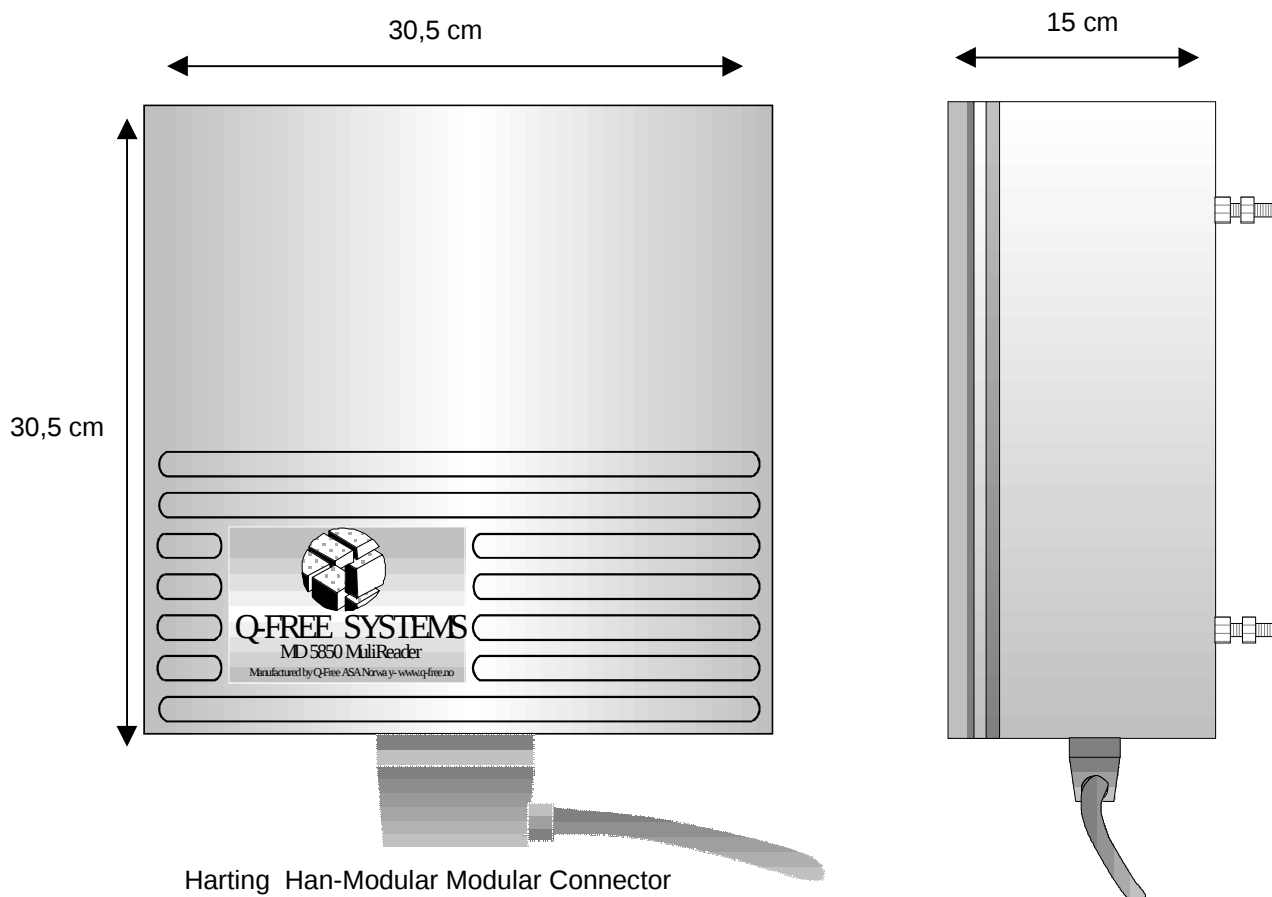
Stand-alone

Weight: 7,4 kg
Size: 30,5 x 30,5 x 15
Mounting: 4 M8 bolts with 20 cm spacing at the rear
Chassis: All metal, corrosion protected by polyester coating
Front: Moulded PVC protection front.

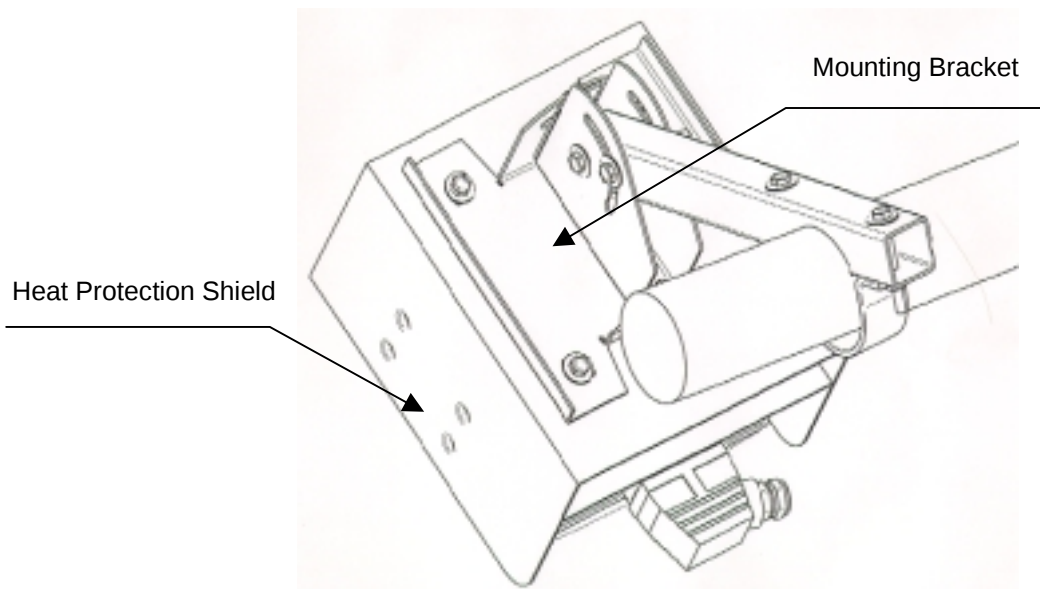
With Heat Protection Kit

Weight: 10,0 kg
Size: 33 x 33 x 19 cm
Mounting: 4 M8 bolts with 20 cm spacing at the rear
Chassis: All metal, corrosion protected by polyester coating
Front: Moulded PVC protection front.

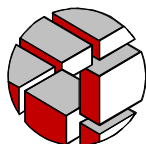
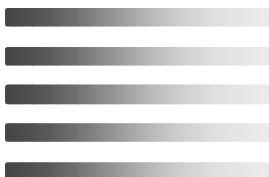
Stand-alone MultiReader MD 5850



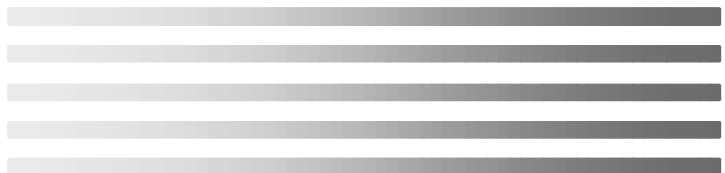
Optional Environmental protection kit.



Whenever there is a need for additional protection against heat and weather conditions, Q-Free ASA can supply a optional protection kit with a built-in fan. The kit allows for installation of the MultiReader under open sky in particularly hot and humid climate. The kit must be specified when ordering.

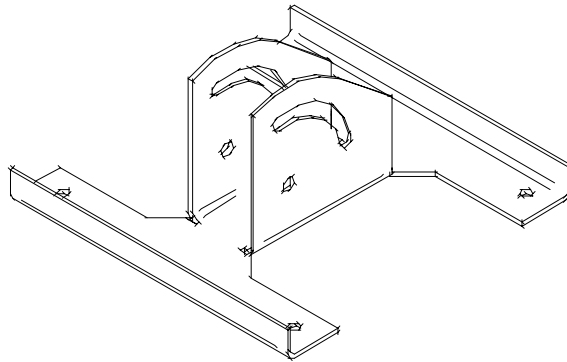


Q-FREE® Systems

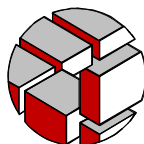
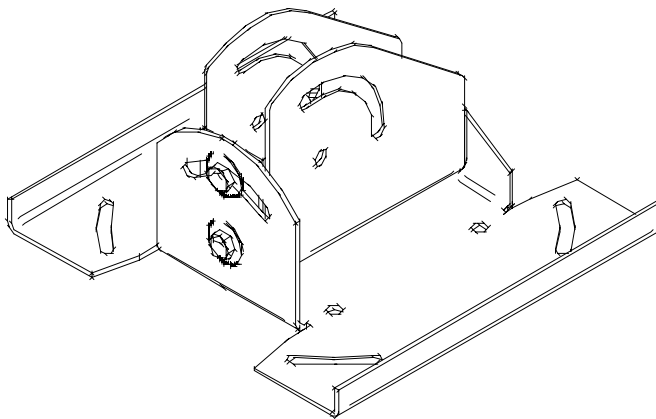


Mounting Brackets

The standard bracket for both modules, RX and TX, allows mounting to a 50x50mm (2x2") square tube. The bracket is made of stainless steel and it allows the module to be adjusted vertically.



A special designed mounting is provided by on request. The bracket is made of stainless steel. It allows the modules to be adjusted both sideways and vertically for maximum flexibility.



Q-FREE® Systems

Environmental conditions

The Multilane equipment is specified to fulfil the environmental conditions defined in ENV ISO 14815 "Road Traffic and Transport Telematics Automatic Vehicle and Equipment Identification System Specification" Class I1. Environmental parameters are classified in accordance to CEI IEC 721-3-4.

Sample extract from CEI IEC 721-3-4

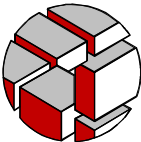
Class 4K4 *	Ambient temperature range	-65°C to +55 °C
Class 4K4	Relative humidity	4% to 100%
Class 4Z5	Movement of surrounding air	50 m/s
Class 4Z8	Water from sources other than rain	Water jets
Class 4B1	Flora and fauna	Presence of mould, fungus, rodents, etc.
Class 4C2	Sea salts and road salts	Condition of salt mist
Class 4S3	Dust (suspension)	1000 mg/m ³
Class 4M4	Stationary vibration	Amplitude: 0.3 mm (2-9 Hz) Acceleration: 10 m/s ² (9-200 Hz) Shock response type I: 100 m/s ²

* For standard equipment without optional heater low air temperature of -33 °C is defined.

EMC Directives

EMC is according to the specifications in EN 300 674 and the EMC directive 89/336/EEC.

Type Approval Certificate:	NO97000446-R
EU-Type examination certificate :	NO199926134001



Q-FREE® Systems

MultiReader Software

SW types

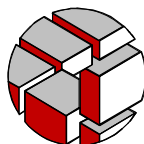
Electronic tolling
Access control
Traffic Management

Applications

Central debiting, electronic purse, smart card, etc.
Borders, parking house/area, industrial area, etc.
Tracking, positioning, message exchanging

MultiReader Hardware

<u>Part no.</u>	<u>Part name</u>	<u>Description</u>
024A0MR1	MD 5850 MultiReader	Top level
2AZCA106	Connector Cable 10pin female	Interface
2A1MHMR1	Connector HAN-Modular for 4 Modules	Interface
10270MR1	MultiReader Transceiver Modem	Main Board
10220MR2	MBX MultiReader Modem	Main Board
14VC6212	CPU Board MVME162-012A	Main Board
016FE8X4	TX/RX Antenna 5.8GHz 20dB	Main Board
01000210	Parallel Interface Board	Optional Board
2015MR05	MR Cabinet Protection Kit	Optional protection
11000013	MD 5850 MR UNI-Bracket	Optional mounting bracket
014N0MR1	Interface MultiReader - 24VDC & Data	Test equipment



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