INDEX

- OPERATING INSTRUCTION
- ETHERNET/IP INTERFACE CONNECTION MANUAL
- MODBUS/TCP INTERFACE CONNECTION MANUAL
- PROFINET IO INTERFACE CONNECTION MANUAL

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UC-RF

Control unit for D52R-E-RF

OPERATING INSTRUCTION

elesa+GANTER

Contents

1. General information 3

1.1 Safety precautions 3
1.2 Description 4
1.3 Connection and mounting 4

2. Instructions 5

2.1 Connection to power supply 5
2.2 Connection to the PLC 5
2.3 Interface configuration 6
2.4 Data exchange between the UC-RF and the DD52R-E-RF 6
2.5 Warning LED 7
2.6 Security 7

3. Technical data 8

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1. General information

1.1 Safety precautions

General remarks

The equipment is designed and assembled according to the latest existing regulations. The equipment is delivered to the customer in perfect working order and in line with all safety-relevant conditions. To maintain this status of the equipment, it is imperative to consider the following when installing and using the device:

- use only according to the intended purpose;
- apply all measures regarding safety and hazards;
- observe the present manual and especially the relevant safety precautions!

Make sure that the operating manual and especially the chapter describing the safety precautions is read and well understood by the staff in charge. Supplementary to the operating instructions, other generally or legally relevant regulations regarding accident prevention and environmental care are to be considered and observed. This manual is a supplement to already existing documentation (product information, mounting instructions, catalogues).

Intended purpose of the equipment

Intended purpose of the equipment is industrial process monitoring and control in packaging, wood, plastic, paper, glass and textile, etc. industry.

It is imperative that the equipment is applied only:

- in properly installed condition;

- in line with the relevant technical data!



Any use beyond the instructions/parameters described in this manual may lead to:

- fatal personal injuries;
- fatal health injuries;
- material damages or
- damage to equipment and property

The device must not be used:
- in explosion hazard areas;
- in medical/life support areas and equipment.

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Do not open the equipment and do not apply any modifications! Modifying the equipment might have a negative impact on reliability of the device and might result in danger!
Do not attempt any repairs, but return any defective equipment to the manufacturer!
Any violation of the integrity of the device as delivered will null the warranty.

Setup/Commissioning

In case of any abnormal behaviour (including change in operating conditions), the device must be switched off immediately.
It is imperative to switch off power supply during any installation work at the equipment. Installation and commissioning by correspondingly trained and authorised staff only. After correct mounting and commissioning the device is ready for operation.

Maintenance/repair

Switch off the power supply of the equipment before any action. Maintenance should be performed by trained and authorised persons only.

1.2 Description

The control unit (UC-RF) is a standard DIN rail module. The unit is provided with plug and socket for connection to a power source and to a PLC. The antenna allows the data exchange with the DD52R-E-RF electronic position indicators (to be ordered separately).
The control unit is used to connect the DD52R-E-RF electronic position indicators to a PLC in order to allow the reading of the actual position of each indicators directly on the PLC and to allow the transmission of the target position from the PLC to the indicators. With this device it is possible to set a target position for each indicator connected to the UC-RF directly from the PLC. The control unit will constantly transmit the target position to each indicator and will receive back the actual position, providing to the PLC and so to the operator the exact situation and position of the command shafts and components of the machine.

1.3 Connections and mounting

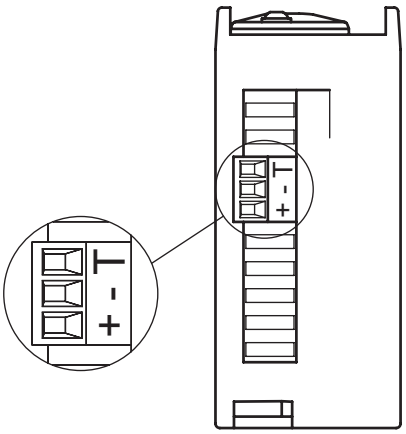
The UC-RF must be connected to 24VDC +/-5% power source.
The connection between the PLC and the UC-RF is to be made using Ethernet cable RJ45
The UC-RF is to be mounted on a DIN Rail thanks to the claws positioned on the back of the device.
The antenna is supplied with the control unit. The antenna must not be mounted inside the cabinet. It is possible to use an extension cable to mount the antenna in a more suitable position. RG 174/U coaxial cable, fitted with SMA male/female connectors must be used. The length of the extension cable will have only a small influence on the quality of the connection.

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2. Instructions

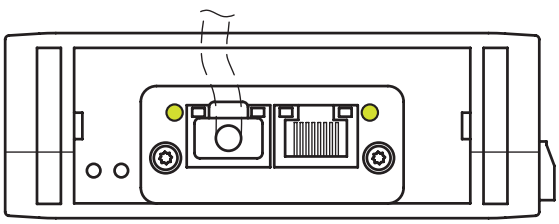
2.1 Connection to power supply

The UC-RF control unit must be connected to a 24VDC +/-5%. See the drawing below for positive, negative and protective earth configuration.



2.2 Connection to the PLC

The UC-RF must be connected to the PLC via an Ethernet cable to one of the two ports, see drawing below. Both ports are equivalent. In case two PLCs, or PLC+PC are connected, make sure conflicts are avoided.



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2.3 Interface configuration

The standard interfaces available for the UC-RF are:

- Ethernet/IP
- Profinet IO
- Modbus/TCP

Other interfaces (Profibus, Canbus, RS 232, RS 485 etc.) can be evaluated on request. For each standard interface it is available the corresponding Interface Connection Manual on the Elesa website. Other useful files to help the programmer to configure the communication between the PLC and the UC-RF are:

- EDS for the Ethernet interface.
- GSDML for the Profinet interface.

For a correct installation of the UC-RF, the programmer must follow the indications and the information on the Interface Connection Manuals.

Once the UC-RF has been correctly installed, it is possible to make the following settings:

- Change the IP Address.
- Change the Net ID from 0 to 1…99 - this allows up to 100 networks to coexist in the same space without interferences.

2.4 Data exchange between the UC-RF and the DD52R-E-RF

The UC-RF communicates only with Elesa DD52R-E-RF indicators. The data exchange uses ISM SRD range of 2.400-2.480GHz. The communication between the indicators and the UC-RF follows a proprietary ELESA protocol. The connection is established immediately after the channel of the indicator is enabled and the indicator is switched on. The indicators' parameter NetID must be set to the same NetID programmed on the UC-RF. For more information on the setting of the Net ID and Net CH parameters, refer to the DD52R-E-RF instructions manual.

The range of the radio link is up to 100m in line of sight. However, in industrial ambients the real range depends on many factors - presence of walls, machine parts, metal obstacles, ecc. - thus, the reasonable value to be considered is up to 30m. The antenna must be placed outside the cabinet in the highest possible position. If necessary, extension cable can be used.

Each control unit can handle up to 36 position indicators.

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2.5 Warning LED

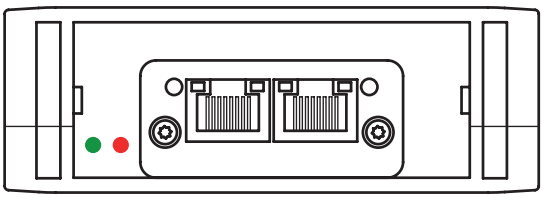
Network module status LEDs - see the network manuals.

UC-RF status LEDs

On successful connection to a channel, the GREEN LED is flashed.

If the connection is lost/transmission packet discarded, the RED LED is flashed. During normal operation, occasional RED LED flash can be observed. This is not an indication of failure.

If the control unit does not establish a connection to a channel after several consecutive connection attempts, it will set the “off-air” flag for that channel.



2.6 Security

Since the communication between the indicators and the UC-RF follows a proprietary ELESA protocol and the control unit cannot process anything different from the expected data, it is not possible to have direct access to the PLC via the UC-RF. For this reason, the radiofrequency connection is protected against system alteration or industrial espionage.

The presence of interferences (various WI-FIs, BLUETOOTHs, etc.) will not affect the correct functioning of the system but could increase slightly the scan time due to discarded transmission packages.

Placing the UC-RF close to power elements (contactors, inverters, motors, etc.) should be avoided or, if impossible, a minimum safety distance of 200mm should be provided.

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3. Technical data

Electrical data	
Supply voltage	24 VDC ±5 %
Power consumption	50 mA
Reverse polarity	Protected
Voltage transitions	Protected
Frequency range	2.400-2.480GHz
Interface options	Ethernet/IP Profinet IO Modbus/TCP
Antenna connector	SMA female
Power supply	3-way terminal block 3.81 mm pitch

Mechanical data	
Mounting	DIN RAIL
Weight	≅ 50 g
Housing material	white-gray ABS reinforced polycarbonate, self-extinguishing

Ambient conditions	
Operating temperature	0 ÷ +50 °C
Storage temperature	-20 ÷ +70 °C
Relative humidity	max. 80 %, not condensing
Environment	indoor use
Altitude	up to 2000 m
General	EN 61010 part 1
ratings	protection class II overvoltage category II pollution degree 2
Interference immunity	EN 61000-6-2
Interference emission	EN 61000-6-3
Approvals	UL/CU

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UC-RF

Control unit for DD52R-E-RF

ETHERNET/IP INTERFACE CONNECTION MANUAL

Release 0F3E1018

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UC-RF - PLC data transfer

This module connects the ELESA UC-RF wireless network (up to 36 DD52R-E-RF) to ETHERNET/IP network.
Power supply - 24VDC +/- 5%
Current consumption - 50mA
Reverse polarity - protected.
Voltage transitions - protected.
The IP address of the module has been preset to 192.168.1.10, subnet 255.255.255.0. DHCP off.
A different IP/subnet can be assigned by the PLC, or using IPConfig utility - downloadable from:
https://www.anybus.com/support/file-doc-downloads/compactcom-30-series-specific/?ordercode=AB6224
The antenna must be fixed on the cabinet's wall or ceiling with its dome outside the cabinet, possibly facing the DD52R-E-RFs on the machine or in highest possible position.
The module handles 100 (0 to 99) network IDs, so up to 100 networks can coexist in the same space. Each module can handle up to 36 DD52R-E-RF; the 36 indicators are part of the networking with the same ID. The parameter Net_id in the rAdio submenu of DD52R-E-RF (default 0, range 0-99) must be programmed to match the ID of the network to which it is associated.

ETHERNET/IP
The EDS file is available. Use DAP V2.0 option.

Communication protocol

The module uses Class 1 (explicit) messaging:
Input assembly

UC-RF → PLC - instance 0x64 (100 DEC), 224 bytes transfer organized as follows:

- offset 0x00 - channel 1 - 4 bytes actual quote, followed by 2 bytes status word
- offset 0x06 - channel 2 - 4 bytes actual quote, followed by 2 bytes status word
- ...
- offset 0xD2 - channel 36 - 4 bytes actual quote, followed by 2 bytes status word
- offset 0xD8 - current network ID
- offset 0xD9 - UC-RF status
  - =0 - UC-RF waiting for networkID
  - =1 - networkID initialized, scanning enabled channels in progress
  - =2 to 255 reserved
- offset 0xDA - reserved
- offset 0xDB - reserved
- offset 0xDC - 4 bytes software release - this manual refers to the release 0F3E1018

Output assembly

PLC → UC-RF - instance 0x96 (150 DEC), 224 bytes transfer organized as follows:

- offset 0x00 - channel 1 - 4 bytes target, followed by 2 bytes command word
- offset 0x06 - channel 2 - 4 bytes target, followed by 2 bytes command word
- ...
- offset 0xD2 - channel 36 - 4 bytes target, followed by 2 bytes command word
- offset 0xD8 - config byte
- offset 0xD9 - config code
  - 0x00 - invalid config byte
  - 0x01 - config byte contains network ID
  - 0x02 to 0xff reserved

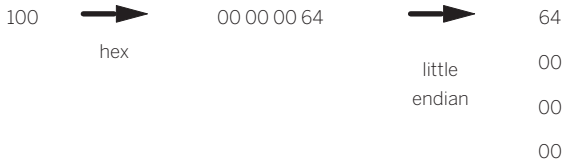
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Attention!

- UC-RF will accept only values 0 to 99 (0x00 to 0x63) for the networkID. All others will be rejected.
- The UC-RF will not start the network scan until it receives a valid networkID from the PLC after power-on. The parameter config code can be left =1 - the UC-RF will check continuously the networkID coming from the PLC and will change it immediately.

- offset 0xDA - reserved
- offset 0xDB - reserved
- offset 0xDC - reserved
- offset 0xDD - reserved
- offset 0xDE - reserved
- offset 0xDF - reserved

The format is little endian, the actual quote/target is four bytes signed binary presenting ALLWAYS 0.01 mm counts.
Ex. 64 00 00 00 == 1.00 mm
1.00 mm = 100 · 0.01 mm



Status word:

bit0-bit5 - reserved

bit6-bit9 - units. These bits indicate the actual unit of measurement of the channel.

Source - DD52R-E-RF.

0000 - 0.01mm
0001 - 0.1mm
0010 - 1mm
0011 - 0.001 inch
0100 - 0.01 inch
0101 - 0.1 inch
0110 - 1 inch
0111 - 0.01 deg
1000 - 0.1 deg
1001 - 1 deg

bit10 - speed error. Indicates rotation speed superior to the programmed. The error is displayed on DD52R-E-RF. **Must** be cleared pressing the F key, then the origin setup **must** be done.

Source - DD52R-E-RF.

bit11 - in position. Set when target reached within the programmed tollerance. Cleared when outside.

Source - DD52R-E-RF.

bit12 - positioning. Set when outside target. Cleared when target reached within programmed tollerance.

Source - DD52R-E-RF.

bit13 - reserved

bit14 - battery low. Set when battery voltage low.

Source - DD52R-E-RF.

bit15 - channel off-air. If set, this bit indicates that the connection with the corresponding channel has been lost. Possible reasons:

- DD52R-E-RF is off
- Channel disabled
- Net_id not set correctly
- Excessive distance to UC-RF

Source - UC-RF.

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Command word:

bit0 - enable channel. Set to enable the corresponding channel. Clear to disable. When disabled, the UC-RF will ignore it.

In case a quick connection with a single channel is needed, it is recommended to disable momentarily the other channels - then the UC-RF will communicate only with the channel enabled.

bit1-bit14 - reserved

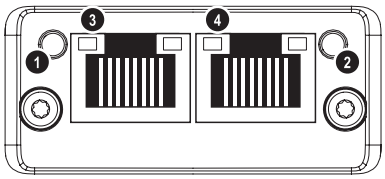
bit15 - Set to indicate the target field contains a valid target. If cleared, no target will be transmitted to the channel.

Once a valid target is sent to UC-RF, this bit can be left set - the target received from the PLC is transmitted continuously to the DD52R-E-RF.

Status LED:

Front View Connector

#	Item
1	Network Status LED[a]
2	Module Status LED[a]
3	Link/Activity LED (port 1)
4	Link/Activity LED (port 2)



Network Status LED

LED State	Description
Off	No power or no IP address
Green	Online, one or more connections established (CIP Class 1 or 3)
Green, flashing	Online, no connections established
Red	Duplicate IP address, FATAL error
Red, flashing	One or more connections timed out (CIP Class 1 or 3)

Module Status LED

LED State	Description
Off	No power
Green	Controlled by a Scanner in Run state
Green, flashing	Not configured, or Scanner in Idle state
Red	Major fault (EXCEPTION-state, FATAL error etc.)
Red, flashing	Recoverable fault(s)

LINK/Activity LED 3/4

LED State	Description
Off	No link, no activity
Green	Link (100 Mbit/s) established
Green, flickering	Activity (100 Mbit/s)
Yellow	Link (10 Mbit/s) established
Yellow, flickering	Activity (10 Mbit/s)

The Ethernet interface supports 10/100Mbit, full or half duplex operation.

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UC-RF

Control unit for DD52R-E-RF

MODBUS/TCP INTERFACE CONNECTION MANUAL

Release 0F3E1018

ELESA S.p.A. Via Pompei, 29 • 20900 Monza (MB) Italia
Tel. +39 039 2811.1 • Fax +39 039 836351 • info@elesa.com

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UC-RF - PLC data transfer

This module connects the ELESA UC-RF wireless network (up to 36 DD52R-E-RF) to MODBUS/TCP network.

Power supply - 24VDC +/-5%.
Current consumption - 50mA
Reverse polarity - protected.
Voltage transitions - protected.

The IP address of the module has been preset to 192.168.1.10, subnet 255.255.255.0.

A different IP/subnet can be assigned by the PLC, or using IPConfig utility - downloadable from:

https://www.anybus.com/support/file-doc-downloads/compactcom-30-series-specific/?ordercode=AB6223

The antenna must be fixed on the cabinet's wall or ceiling with its dome outside the cabinet, possibly facing the DD52R-E-RFs on the machine.

The module handles 100 (0 to 99) network IDs, so up to 100 networks can coexist in the same space. Each module can handle up to 36 DD52R-E-RF; the 36 indicators are part of the networking with the same ID. The parameter Net_id in the rAdio submenu of DD52R-E-RF (default 0, range 0-99) must be programmed to match the ID of the network to which it is associated.

Communication protocol

READ/WRITE - updated by the PLC

- 0x00, 0x01 - channel 1 - 4 bytes target, RW
- 0x02, 0x03 - channel 2 - 4 bytes target, RW
- ...
- 0x46, 0x47 - channel 36 - 4 bytes target, RW

- 0x48 - channel 1 - command, RW
- 0x49 - channel2 - command, RW
- ...
- 0x6B - channel 36 - command, RW

- 0x6C - config, RW
    - LSB - config byte
    - MSB - config truth
        - 0 - config byte not valid
        - 1 - config byte contains network ID
        - 0x02 to 0xff reserved
- 0x6D - reserved, RW
- 0x6E - reserved, RW
- 0x6F - reserved, RW

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Attention!

- UC-RF will accept only values 0 to 99 (0x00 to 0x63) for the networkID. All others will be rejected.
- The UC-RF will not start the network scan until it receives a valid networkID from the PLC after power-on.

The parameter config code can be left =1 - the UC-RF will check continuously the networkID coming from the PLC and will change it immediately.

READ only - updated by the UC-RF

- 0x100, 0x101 - channel 1 - 4 bytes position, R
- 0x102, 0x103 - channel 2 - 4 bytes position, R
- ...
- 0x146, 0x147 - channel 36 - 4 bytes position, R

- 0x148 - channel 1 status, R
- 0x149 - channel2 status, R
- ...
- 0x16b - channel 36 status, R

- 0x16c - R
  - LSB - current network ID
  - MSB - reserved
- 0x16d - reserved, R
- 0x16e-0x16f - 4 bytes software release - this manual refers to the release 0F3E1018

The format is little endian, the actual quote/target is four bytes signed binary presenting ALLWAYS 0.01 mm counts.

Ex. 64 00 00 00 == 1.00 mm
1.00 mm = 100 • 0.01 mm

100 → hex 00 00 00 64 → little endian 64 00 00 00

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Status word:
bit0-bit5 - reserved
bit6-bit9 - units. These bits indicate the actual unit of measurement of the channel.

Source - DD52R-E-RF.

0000 - 0.01mm
0001 - 0.1mm
0010 - 1mm
0011 - 0.001 inch
0100 - 0.01 inch
0101 - 0.1 inch
0110 - 1 inch
0111 - 0.01 deg
1000 - 0.1 deg
1001 - 1 deg

bit10 - speed error. Indicates rotation speed superior to the programmed. The error is displayed on DD52R-E-RF. **Must** be cleared pressing the F key, then the origin setup **must** be done.

Source - DD52R-E-RF.

bit11 - in position. Set when target reached within the programmed tollerance. Cleared when outside.

Source - DD52R-E-RF.

bit12 - positioning. Set when outside target. Cleared when target reached within programmed tollerance.
Source - DD52R-E-RF.

bit13 - reserved

bit14 - battery low. Set when battery voltage low.

Source - DD52R-E-RF.

bit15 - channel off-air. If set, this bit indicates that the connection with the corresponding channel has been lost. Possible reasons:

- DD52R-E-RF is off
- Channel disabled
- Net_id not set correctly
- Excessive distance to UC-RF

Source - UC-RF.

Command word:

bit0 - enable channel. Set to enable the corresponding channel. Clear to disable. When disabled, the UC-RF will ignore it, and channel off-air flag will be set.

In case a quick connection with a single channel is needed, it is recommended to disable momentarily the other channels - then the UC-RF will communicate only with the channel enabled.

bit1-bit14 - reserved

bit15 - Set to indicate the target field contains a valid target. If cleared, no target will be transmitted to the channel.

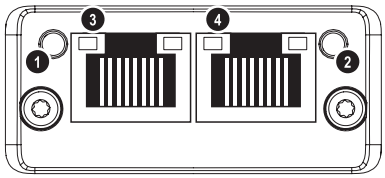
Once a valid target is sent to UC-RF, this bit can be left set - the target received from the PLC is transmitted continuously to the DD52R-E-RF.

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Status LED:

Front View Connector

#	Item
1	Network Status LED
2	Module Status LED
3	Link/Activity LED (port 1)
4	Link/Activity LED (port 2)



Network Status LED

LED State	Description
Off	No power or no IP address
Green	Module is in Process Active or Idle state
Green, flashing	Waiting for connections
Red	Duplicate IP address, or FATAL event
Red, flashing	Process Active Timeout.

Module Status LED

LED State	Description
Off	No power
Green	Normal operation
Red	Major fault; module is in state EXCEPTION (or FATAL event)
Red, flashing	Minor fault in diagnostic object IP conflict

LINK/Activity LEDs

LED State	Description
Off	No link, no activity
Green	Link established, 100 Mbit/s
Green, flickering	Activity, 100 Mbit/s
Yellow	Link established, 10 Mbit/s
Yellow, flickering	Activity, 10 Mbit/s

The Ethernet interface supports 10/100 Mbit/s, full or half duplex operation.

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UC-RF

Control unit for DD52R-E-RF

PROFINET IO INTERFACE CONNECTION MANUAL

Release 0F3E1018

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UC-RF - PLC data transfer

The UC-RF module connects the ELESA UC-RF wireless network (up to 36 DD52R-E-RF at present) to PROFINET IO network.

Power supply - 24VDC +/- 5%

Current consumption - 50mA@24VDC

Reverse polarity - protected.

Voltage transitions - protected.

The IP address of the module has been preset to 192.168.1.10, subnet 255.255.255.0. DHCP off.

A different IP/subnet can be assigned by the PLC, or using IPConfig utility - downloadable from:

https://www.anybus.com/support/file-doc-downloads/compactcom-30-series-specific/?ordercode=AB6221

The antenna must be fixed on the cabinet's wall or ceiling with its dome outside the cabinet, possibly facing the DD52R-E-RFs on the machine or in highest possible position.

The module handles 100 (0 to 99) network IDs, so up to 100 networks can coexist in the same space. Each module can handle up to 36 DD52R-E-RF; the 36 indicators are part of the networking with the same ID. The parameter Net_id in the rAdio submenu of DD52R-E-RF (default 0, range 0-99) must be programmed to match the ID of the network to which it is associated.

PROFINET IO

The GSD file is available as well. Use DAP V2.0 option.
56 slots used. Each slot contains 8 bytes.
Slot 0 to Slot 28 - output (PLC to UC)
Slot 29 to Slot 56 - input (UC to PLC)

Communication protocol

The data block length is 224 bytes:

INPUT UC-RF → PLC

- offset 0x00 - channel 1 - 4 bytes actual quote, followed by 2 bytes status word
- offset 0x06 - channel 2 - 4 bytes actual quote, followed by 2 bytes status word
- ...
- offset 0xD2 - channel 36 - 4 bytes actual quote, followed by 2 bytes status word
- offset 0xD9 - UC-RF status
  =0 - UC-RF waiting for networkID
  =1 - networkID initialized, scanning enabled channels in progress
  =2 to 255 reserved
- offset 0xDA - reserved
- offset 0xDB - reserved
- offset 0xDC - 4 bytes software release - this manual refers to the release 0F3E1018

OUTPUT PLC → UC-RF

- offset 0x00 - channel 1 - 4 bytes target, followed by 2 bytes command word
- offset 0x06 - channel 2 - 4 bytes target, followed by 2 bytes command word
- ...
- offset 0xD2 - channel 36 - 4 bytes target, followed by 2 bytes command word
- offset 0xD8 - config byte
- offset 0xD9 - config code
  - 0x00 - invalid config byte
  - 0x01 - config byte contains network ID
  - 0x02 to 0xff reserved

Attention!

UC-RF will accept only values 0 to 99 (0x00 to 0x63) for the networkID. All others will be rejected.

The UC-RF will not start the network scan until it receives a valid networkID from the PLC after power-on. The parameter config code can be left =1 - the UC-RF will check continuously the networkID coming from the PLC and will change it immediately.

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- offset 0xDA - reserved
- offset 0xDB - reserved
- offset 0xDC - reserved
- offset 0xDD - reserved
- offset 0xDE - reserved
- offset 0xDF - reserved

The byte order is little endian, the actual quote/target is four bytes signed binary presenting ALLWAYS 0.01 mm counts.
Ex. 64 00 00 00 == 1.00 mm
1.00 mm = 100 · 0.01 mm

100 → (hex) 00 00 00 64 → (little endian) 64 00 00 00

Status word:
bit0-bit5 - reserved
bit6-bit9 - units. These bits indicate the actual unit of measurement of the channel.

Source - DD52R-E-RF.

0000 - 0.01mm
0001 - 0.1mm
0010 - 1mm
0011 - 0.001 inch
0100 - 0.01 inch
0101 - 0.1 inch
0110 - 1 inch
0111 - 0.01 deg
1000 - 0.1 deg
1001 - 1 deg

bit10 - speed error. Indicates rotation speed superior to the programmed. The error is displayed on DD52R-E-RF. **Must** be cleared pressing the F key, then the origin setup **must** be done.

Source - DD52R-E-RF.

bit11 - in position. Set when target reached within the programmed tolerance. Cleared when outside.

Source - DD52R-E-RF.

bit12 - positioning. Set when outside target. Cleared when target reached within programmed tolerance.

Source - DD52R-E-RF.

bit13 - reserved

bit14 - battery low. Set when battery voltage low.

Source - DD52R-E-RF.

bit15 - channel off-air. If set, this bit indicates that the connection with the corresponding channel has been lost. Possible reasons:

- DD52R-E-RF is off
- Channel disabled
- Net_id parameter not set correctly
- Excessive distance to UC-RF

Source - UC-RF.

Command word:
bit0 - enable channel. Set to enable the corresponding channel. Clear to disable. When disabled, the UC-RF will ignore it, and channel off-air flag will be set.
In case a quick connection with a single channel is needed, it is recommended to disable momentarily the other channels - then the UC-RF will communicate only with the channel enabled.
bit1-bit14 - reserved
bit15 - Set to indicate the target field contains a valid target. If cleared, no target will be transmitted to the channel.

Once a valid target is sent to UC-RF, this bit can be left set - the target received from the PLC is transmitted continuously to the DD52R-E-RF.

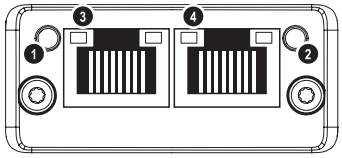
Attention!
After the first time connection, the UC-RF will wait for a Station Name to be assigned by the PLC. Without this, the data transfer will not be started - see the module LED description.

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Status LED:

Front View Connector

#	Item
1	Network Status LED
2	Module Status LED
3	Link/Activity LED (port 1)
4	Link/Activity LED (port 2)



Network Status LED

LED State	Description	Comments
Off	Offline	• No power • No connection with IO Controller
Green	Online (RUN)	• Connection with IO Controller established • IO Controller in RUN state
Green, 1 flash	Online (STOP)	• Connection with IO Controller established • IO Controller in STOP state or IO data bad • IRT synchronization not finished
Green, blinking	Blink	Used by engineering tools to identify the node on the network
Red	Fatal event	Major internal error (this indication is combined with a red module status LED)
Red, 1 flash	Station Name error	Station Name not set
Red, 2 flashes	IP address error	IP address not set
Red, 3 flashes	Configuration error	Expected Identification differs from Real Identification

Module Status LED

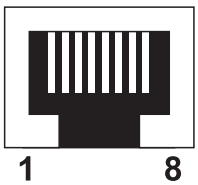
LED State	Description	Comments
Off	Not Initialized	No power OR Module in SETUP or NW_INIT state.
Green	Normal Operation	Module has shifted from the NW_INIT state.
Green, 1 flash	Diagnostic Event(s)	Diagnostic event(s) present
Red	Exception error	Device in state EXCEPTION.
	Fatal event	Major internal error (this indication is combined with a red network status LED)
Alternating Red/ Greed	Firmware update	Do NOT power off the module. Turning the module off during this phase could cause permanent damage.

LINK/Activity LED

LED State	Description	Comments
Off	No Link	No link, no communication present
Green	Link	Ethernet link established, no communication present
Green, flickering	Activity	Ethernet link established, communication present

The Ethernet interface operates at 100 Mbit, full duplex, as required by PROFINET.

Pin no	Description
1, 2, 4, 5	Connected to chassis ground over serial RC circuit
3	RD-
6	RD+
7	TD-
8	TD+
Housing	Cable Shield



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