

INTERNATIONAL ELECTROTECHNICAL COMMISSION
COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

IEC 62439-7
Edition 1.0 2011-12

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**INDUSTRIAL COMMUNICATION NETWORKS –
HIGH AVAILABILITY AUTOMATION NETWORKS –
Part 7: Ring-based Redundancy Protocol (RRP)**

**RESEAUX DE COMMUNICATION INDUSTRIELS –
RESEAUX DE HAUTE DISPONIBILITE POUR
L'AUTOMATION – Partie 7: Protocole de
redondance pour réseau en anneau (RRP)**

C O R R I G E N D U M 1

Corrections to the French version appear after the English text.

Les corrections à la version française sont données après le texte anglais.

10 RRP Management Information Base (MIB)

Replace the existing text in Clause 10 with the following text (note that only sections highlighted in yellow have actually been changed):

```
-- *****
IEC-62439-7-MIB DEFINITIONS ::= BEGIN

-- *****
-- Imports
-- *****

IMPORTS
    OBJECT-IDENTITY,
    OBJECT-TYPE,
    TimeTicks,
    Counter32,
    Unsigned32,
    Counter64,
    VISIBLE-STRING,
    INTEGER                FROM SNMPv2-SMI
    Boolean                 FROM HOST-RESOURCES-MIB
    MacAddress              FROM BRIDGE-MIB
    iso                     FROM RFC1155-SMI;

-- *****
-- Declaration of TIMEOFDAY
-- *****
TIMEOFDAY ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION "
        The IEC 61158-5-21 defines the structure of
        the TIMEOFDAY as a data type numeric
        identifier 12.
    "
    SYNTAX VISIBLE STRING (SIZE (6))

-- *****
```

```
-- Root OID
-- *****
iec62439  MODULE-IDENTITY
          LAST-UPDATED "201306110000Z" -- June 11, 2013
          ORGANIZATION "IEC/SC 65C"
          CONTACT-INFO "
```

```
          International Electrotechnical Commission
          IEC Central Office
          3, rue de Varembe
          P.O. Box 131
          CH - 1211 GENEVA 20
          Switzerland
          Phone: +41 22 919 02 11
          Fax: +41 22 919 03 00
          email: info@iec.ch
```

```
DESCRIPTION "
This MIB module defines the Network Management interfaces
for the Redundancy Protocols defined by the IEC
standard 62439.
"
```

```
REVISION "201306110000Z" -- June 11, 2013
```

```
DESCRIPTION "
Consistency adjustment with other parts of IEC 62439
"
```

```
REVISION "200811100000Z" -- November 10, 2008
```

```
DESCRIPTION "
Seperation of IEC 62439 into a suite of documents.
This MIB applies to IEC 62439-7, added RRP functionality.
"
```

```
REVISION "200708240000Z" -- August 24, 2007
```

```
DESCRIPTION "
Initial version of the Network Management interface for the
Ring-based Redundancy Protocol
"
```

```
::= { IEC 62439 }
```

```
-- *****
-- Redundancy Protocols
-- *****
```

```
mrp      OBJECT IDENTIFIER ::= { iec62439 1 }
prp      OBJECT IDENTIFIER ::= { iec62439 2 }
crp      OBJECT IDENTIFIER ::= { iec62439 3 }
brp      OBJECT IDENTIFIER ::= { iec62439 4 }
drp      OBJECT IDENTIFIER ::= { iec62439 5 }
rrp      OBJECT IDENTIFIER ::= { iec62439 6 }
```

```
-- *****
-- Objects of the RRP Network Management
-- *****
```

```
ServiceID OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      mandatory
DESCRIPTION "
specifies information sufficient for local
identification of the RRP device that will
convey the service
"
```

```
::= { rrp 1 }
```

```
InvokeID  OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      mandatory
DESCRIPTION "
specifies the invocation of the service
"
```

```
::= { rrp 2 }
```

```
DeviceAddress OBJECT-TYPE
SYNTAX      INTEGER
```



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```

MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the value for the RRP device address
                "

 ::= { rrp 3 }

DeviceFlags      OBJECT-TYPE
SYNTAX          BITS {
                DeviceAddressCollision(0),
                DeviceStateChanged(1)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the flags for events that occurred
                in a local device
                "

 ::= { rrp 4 }

DeviceState      OBJECT-TYPE
SYNTAX          INTEGER {
                Invalid(0),
                SA(1),
                LNM(2),
                GD(3),
                RNMP(4),
                RNMS(5)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the device state of the RRP device
                "

 ::= { rrp 5 }

DeviceUID        OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the unique 8-octet identification that
                identifies a RRP device in a network
                "

 ::= { rrp 6 }

DeviceUIDRport1 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device that is linked
                through the R-port1
                "

 ::= { rrp 7 }

DeviceUIDRport2 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device that is linked
                through the R-port2
                "

 ::= { rrp 8 }

MACAddress       OBJECT-TYPE
SYNTAX          MacAddress
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the MAC address of the RRP device
                "

 ::= { rrp 9 }

Rport1Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),

```

```

        PortCFMFamily(1),
        PortWaitADV(2),
        PortWaitML(3)
        PortCFM(4)
    }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port1
                "
 ::= { rrp 10 }

Rport2Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),
                PortCFMFamily(1),
                PortWaitADV(2),
                PortWaitML(3)
                PortCFM(4)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the port information for R-port2
                "
 ::= { rrp 11 }

Version          OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the protocol version of the RRP device
                "
 ::= { rrp 12 }

DeviceType       OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the local device type that represents
                the general function of the device
                "
 ::= { rrp 13 }

DeviceDescription OBJECT-TYPE
SYNTAX          VISIBLE-STRING (SIZE(1..16))
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies a description of the local device
                "
 ::= { rrp 14 }

FamilyResWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the FamilyReq
                frame and receiving the FamilyRes frame
                "
 ::= { rrp 15 }

AdvThisWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the MediaLinked
                frame and receiving the AdvThis frame
                "
 ::= { rrp 16 }

AckRNMSWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write

```



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```

STATUS          mandatory
DESCRIPTION     "
                specifies the time interval between sending the RingStart
                frame and receiving the AckRNMS frame
                "
 ::= { rrp 17 }

RingStateChangeTimeout  OBJECT-TYPE
SYNTAX              Unsigned32
MAX-ACCESS          read-write
STATUS              mandatory
DESCRIPTION         "
                specifies the timeout to generate event for changing
                RNMP device state
                "
 ::= { rrp 18 }

DiagnosticInformation  OBJECT-TYPE
SYNTAX              INTEGER {
                    NetworkInformation(1),
                    PathTableInformation(2)
                    }
MAX-ACCESS          write-only
STATUS              mandatory
DESCRIPTION         "
                specifies the type of diagnostic information
                "
 ::= { rrp 19 }

-- *****
-- Objects of the RRP Network Information
-- *****

NetworkTopology  OBJECT-TYPE
SYNTAX          INTEGER {
                Invalid(0),
                NET_TPG_SA(1),
                NET_TPG_LINE(2),
                NET_TPG_RING(3)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the type of network topology
                "
 ::= { rrp 20 }

CollisionCnt  OBJECT-TYPE
SYNTAX        INTEGER
MAX-ACCESS    read-only
STATUS        mandatory
DESCRIPTION   "
                specifies the device address collision count
                for remote devices
                "
 ::= { rrp 21 }

DeviceCnt  OBJECT-TYPE
SYNTAX     INTEGER
MAX-ACCESS read-only
STATUS     mandatory
DESCRIPTION "
                specifies the total number of devices on the network
                "
 ::= { rrp 22 }

TopologyChangeCnt  OBJECT-TYPE
SYNTAX              INTEGER
MAX-ACCESS          read-only
STATUS              mandatory
DESCRIPTION         "
                specifies the topology change count
                "
 ::= { rrp 23 }

LastTopologyChangeTime  OBJECT-TYPE
SYNTAX                  TIMEOFDAY
MAX-ACCESS              read-only

```

```
STATUS          mandatory
DESCRIPTION     "
                specifies the date and time at which the network topology
                was last changed
                "
 ::= { rrp 24 }

RNMPDeviceUID   OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the RNMP
                on the network
                "
 ::= { rrp 25 }

RNMSDeviceUID   OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the RNMS
                on the network
                "
 ::= { rrp 26 }

LNMDDeviceUIDRport1 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the LNM
                in the R-port1 direction
                "
 ::= { rrp 27 }

LNMDDeviceUIDRport2 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                specifies the UID of the device selected as the LNM
                in the R-port2 direction
                "
 ::= { rrp 28 }

NetworkFlags    OBJECT-TYPE
SYNTAX          BITS {
                NetworkTopologyChanged(0),
                DeviceAddressCollisionInNetwork(1),
                DeviceJoinedNetwork(2),
                DeviceLeftNetwork(3)
                }
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                specifies the flags for events that occurred
                in the network
                "
 ::= { rrp 29 }

-- *****
-- Objects of the RRP Path Table Information
-- *****

PathTableInfo   OBJECT-TYPE
SYNTAX          SEQUENCE OF PathTableInfoEntry
MAX-ACCESS     read-only
STATUS         mandatory
DESCRIPTION     "
                Path Table in the form of an array table containing
                the path information foreach RRP device on the network
                "
 ::= { rrp 30 }

PathTableEntry  OBJECT-TYPE
SYNTAX          PathTableInfoEntry
```



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```

MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "Row of Path Table Information"
INDEX          { PathTableIndex }
 ::= { PathTableInfo 1 }

PathTableInfoEntry ::= SEQUENCE {
    pathDevAddress      INTEGER,
    pathHopCntRp1      INTEGER,
    pathHopCntRp2      INTEGER,
    pathPreferRp       INTEGER,
    pathDstRp          INTEGER,
    pathDevState       INTEGER,
    pathMACAddress     MacAddress,
    pathRp1Info        INTEGER,
    pathRp2Info        INTEGER,
    pathVersion        INTEGER,
    pathDevType        INTEGER,
    pathDevDesc        VISIBLE STRING (SIZE (1..16)),
    pathDevUID         Counter64,
    pathDevUIDRp1     Counter64,
    pathDevUIDRp2     Counter64
}

END
-- *****
-- EOF
-- *****

```

Corrections à la version française:

10 Base d'informations d'administration RRP (MIB)

Remplacer le texte existant de l'Article 10 par le texte suivant (à noter que seules les sections surlignées en jaune ont été effectivement modifiées):

```

-- *****
IEC-62439-7-MIB DEFINITIONS ::= BEGIN
-- *****
-- Imports
-- *****

IMPORTS
    OBJECT-IDENTITY,
    OBJECT-TYPE,
    TimeTicks,
    Counter32,
    Unsigned32,
    Counter64,
    VISIBLE-STRING,
    INTEGER                FROM SNMPv2-SMI
    Boolean                FROM HOST-RESOURCES-MIB
    MacAddress             FROM BRIDGE-MIB
    iso                   FROM RFC1155-SMI;

-- *****
-- Declaration of TIMEOFDAY
-- *****
TIMEOFDAY ::= TEXTUAL-CONVENTION
    STATUS          current
    DESCRIPTION "
        The IEC 61158-5-21 defines the structure of
        the TIMEOFDAY as a data type numeric
        identifier 12.
    "
    SYNTAX          VISIBLE STRING (SIZE (6))

```

-- *****
-- Root OID
-- *****

iec62439 MODULE-IDENTITY
LAST-UPDATED "201306110000Z" -- June 11, 2013
ORGANIZATION "IEC/SC 65C"
CONTACT-INFO "
International Electrotechnical Commission
IEC Central Office
3, rue de Varembe
P.O. Box 131
CH - 1211 GENEVA 20
Switzerland
Phone: +41 22 919 02 11
Fax: +41 22 919 03 00
email: info@iec.ch

DESCRIPTION "
This MIB module defines the Network Management interfaces
for the Redundancy Protocols defined by the IEC
standard 62439.
"

REVISION "201306110000Z" -- June 11, 2013
DESCRIPTION "
Consistency adjustment with other parts of IEC 62439
"

REVISION "200811100000Z" -- November 10, 2008
DESCRIPTION "
Seperation of IEC 62439 into a suite of documents.
This MIB applies to IEC 62439-7, added RRP functionality.
"

REVISION "200708240000Z" -- August 24, 2007
DESCRIPTION "
Initial version of the Network Management interface for the
Ring-based Redundancy Protocol
"

::= { IEC 62439 }

-- *****
-- Redundancy Protocols
-- *****

mrp OBJECT IDENTIFIER ::= { iec62439 1 }
prp OBJECT IDENTIFIER ::= { iec62439 2 }
crp OBJECT IDENTIFIER ::= { iec62439 3 }
brp OBJECT IDENTIFIER ::= { iec62439 4 }
drp OBJECT IDENTIFIER ::= { iec62439 5 }
rrp OBJECT IDENTIFIER ::= { iec62439 6 }

-- *****
-- Objects of the RRP Network Management
-- *****

ServiceID OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-write
STATUS mandatory
DESCRIPTION "
specifies information sufficient for local
identification of the RRP device that will
convey the service
"

::= { rrp 1 }

InvokeID OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-write
STATUS mandatory
DESCRIPTION "
specifies the invocation of the service
"

::= { rrp 2 }

DeviceAddress OBJECT-TYPE



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```

SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the value for the RRP device address
                "

 ::= { rrp 3 }

DeviceFlags     OBJECT-TYPE
SYNTAX          BITS {
                DeviceAddressCollision(0),
                DeviceStateChanged(1)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the flags for events that occurred
                in a local device
                "

 ::= { rrp 4 }

DeviceState     OBJECT-TYPE
SYNTAX          INTEGER {
                Invalid(0),
                SA(1),
                LNM(2),
                GD(3),
                RNMP(4),
                RNMS(5)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the device state of the RRP device
                "

 ::= { rrp 5 }

DeviceUID       OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the unique 8-octet identification that
                identifies a RRP device in a network
                "

 ::= { rrp 6 }

DeviceUIDRport1 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device that is linked
                through the R-port1
                "

 ::= { rrp 7 }

DeviceUIDRport2 OBJECT-TYPE
SYNTAX          Counter64
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION     "
                specifies the UID of the device that is linked
                through the R-port2
                "

 ::= { rrp 8 }

MACAddress      OBJECT-TYPE
SYNTAX          MacAddress
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION     "
                specifies the MAC address of the RRP device
                "

 ::= { rrp 9 }

Rport1Information OBJECT-TYPE
SYNTAX          BITS {

```

```

        PortLinkDown(0),
        PortCFMFamily(1),
        PortWaitADV(2),
        PortWaitML(3)
        PortCFM(4)
    }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION    "
               specifies the port information for R-port1
               "
 ::= { rrp 10 }

Rport2Information OBJECT-TYPE
SYNTAX          BITS {
                PortLinkDown(0),
                PortCFMFamily(1),
                PortWaitADV(2),
                PortWaitML(3)
                PortCFM(4)
                }
MAX-ACCESS      read-only
STATUS          mandatory
DESCRIPTION    "
               specifies the port information for R-port2
               "
 ::= { rrp 11 }

Version          OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION    "
               specifies the protocol version of the RRP device
               "
 ::= { rrp 12 }

DeviceType       OBJECT-TYPE
SYNTAX          INTEGER
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION    "
               specifies the local device type that represents
               the general function of the device
               "
 ::= { rrp 13 }

DeviceDescription OBJECT-TYPE
SYNTAX          VISIBL STRING (SIZE(1..16))
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION    "
               specifies a description of the local device
               "
 ::= { rrp 14 }

FamilyResWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION    "
               specifies the time interval between sending the FamilyReq
               frame and receiving the FamilyRes frame
               "
 ::= { rrp 15 }

AdvThisWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32
MAX-ACCESS      read-write
STATUS          mandatory
DESCRIPTION    "
               specifies the time interval between sending the MediaLinked
               frame and receiving the AdvThis frame
               "
 ::= { rrp 16 }

AckRNMSWaitingTime OBJECT-TYPE
SYNTAX          Unsigned32

```

