



ATLANTE EVO

ISTRUZIONI D'USO E MANUTENZIONE
USE AND MAINTENANCE INSTRUCTIONS
INSTRUCTIONS D'EMPLOI ET ENTRETIEN
INSTRUCCIONES DE USO Y MANTENIMIENTO
BETRIEBS- UND WARTUNGSANWEISUNG

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Certificazioni del prodotto
(inquadrare il codice QR).
*Product certifications
(frame the QR code).*



Istruzioni per il corretto smaltimento del prodotto
(inquadrare il codice QR).
*Instructions for proper disposal of the product
(frame the QR code).*

1 ISTRUZIONI D'USO E MANUTENZIONE

(Italiano - Istruzioni originali)

Conformità alle Direttive Comunitarie: 2014/30/UE, 2014/35/UE, 2006/42/CE

Conformità alle Norme CE: EN 60204-1, EN60947-1, EN 60947-5-1, EN 60529, EN 61326-1

Conforme al regolamento per la prevenzione degli infortuni BGV C1 (solo per la Germania)

Marcature:   (pending)

Temperatura di funzionamento: -25°C +80°C

Grado di protezione: IP65 / IP67

ATTENZIONE

Non utilizzare l'apparecchio in ambienti con atmosfera potenzialmente esplosiva o con presenza di agenti corrosivi. Adatto per uso in presenza di nebbia salina secondo le norme (IEC 60068-2-11 e STD UL 50E), a seconda delle versioni. Il contatto con oli, acidi e solventi può danneggiare l'apparecchio.

Le operazioni di installazione, utilizzo e manutenzione devono essere eseguite solo da personale qualificato.

I collegamenti devono essere effettuati seguendo le istruzioni.

Prima di eseguire operazioni di installazione e manutenzione scollegare l'apparecchio dall'alimentazione elettrica.

Qualsiasi modifica ai componenti dell'apparecchio annulla la validità dei dati di targa ed identificazione dell'apparecchio e fa decadere i termini di garanzia.

Nel caso un componente debba essere sostituito, utilizzare solo ricambi originali.

TER declina ogni responsabilità da danni derivanti dall'uso improprio dell'apparecchio o da una sua installazione non corretta.

MANUTENZIONE

È necessario controllare mensilmente le condizioni dell'apparecchio.

Controllare che i punti di fissaggio siano ben saldi e che il cavo sia in perfette condizioni.

Controllare che l'involucro non sia danneggiato o ammaccato.

Non effettuare fori o incisioni sull'involucro perchè potrebbero danneggiare la scheda interna ed alterare il grado di protezione IP.

Se si rilevano difetti meccanici o elettrici, sostituire l'apparecchio: NON aprire in nessun caso l'apparecchio perchè si potrebbe comprometterne l'efficienza.

NON oliare e/o ingrassare l'albero o le parti rotanti.

Assicurarsi di seguire sempre le indicazioni riportate nella documentazione fornita con il prodotto.

ATTENZIONE: il mancato rispetto delle istruzioni e delle specifiche indicate compromette la funzionalità e la sicurezza dell'impianto.

1 USE AND MAINTENANCE INSTRUCTIONS

(English - Translation of the original instructions)

Conformity to Community Directives: 2014/30/UE, 2014/35/UE, 2006/42/CE

Conformity to CE Standards: EN 60204-1, EN60947-1, EN 60947-5-1, EN 60529, EN 61326-1

Complying with accident prevention regulation BGV C1 (only for Germany)

Markings:   (pending)

Operational temperature: -25°C +80°C

Protection degree: IP65 / IP67

ATTENTION

Do not use the equipment in environments with a potentially explosive atmosphere or corrosive agents. Suitable for use in salt mist environments according to the standards (IEC 60068-2-11 and STD UL 50E), depending on the version. Contact with oils, acids and solvents may damage the equipment.

Operations of installation, use and maintenance must be carried out by skilled personnel only.

Wiring shall be properly done according to the current instructions.

Before installation and maintenance disconnect the equipment from the power mains.

Any change to parts of the equipment will invalidate the rating plate data and identification of the equipment, and render the warranty null and void.

Should any component need replacement, use original spare parts only.

TER is not liable for damages caused by improper use of the equipment and installation which is not made correctly.

MAINTENANCE

The conditions of the equipment must be checked monthly.

Check that the fixing points are stable and that the cable is in perfect conditions.

Check that the casing is not damaged or dented.

Do not make holes or notches on the casing, as this may damage the internal card and alter the IP protection degree.

In case of any mechanical or electronic failure, replace the equipment: DO NOT open the equipment under any circumstances as this would affect its efficiency.

DO NOT oil and/or grease the shaft and the rotating parts.

Make sure you always follow the directions given in the documentation supplied with the product.

ATTENTION: failure to follow these instructions and technical specifications will jeopardize functioning and safety of the system.

1 INSTRUCTIONS D'EMPLOI ET ENTRETIEN

(Français - Traduction des instructions originales)

Conformité aux Directives Communautaires: 2014/30/UE, 2014/35/UE, 2006/42/CE

Conformité aux Normes CE: EN 60204-1, EN60947-1, EN 60947-5-1, EN 60529, EN 61326-1

Conforme au Règlement BGV C1 en matière de prévention des accidents (seulement pour Allemagne)

Marquage:   (pending)

Température d'utilisation: -25°C +80°C

Degré de protection: IP65 / IP67

ATTENTION

N'utilisez pas l'appareil dans environnements avec atmosphère potentiellement explosive ou en présence d'agents corrosifs. L'appareil peut être utilisé en présence de brouillard salin selon les normes (IEC 60068-2-11 et STD UL 50E), selon la version. Le contact avec des huiles, des acides et des solvants risque d'endommager l'appareil.

L'installation, l'utilisation et l'entretien doivent être effectués par du personnel qualifié.

Les connexions doivent être effectuées conformément aux instructions.

Avant d'installer ou d'effectuer des opérations d'entretien sur l'appareil, couper l'alimentation principale.

Toute modification des composants de l'appareil annule la validité des données de la plaquette signalétique de l'appareil et invalide la garantie.

Lors du remplacement d'un composant quelconque, utiliser exclusivement des pièces de rechange originales.

TER décline toute responsabilité en cas de dommages résultants d'une mauvaise utilisation de l'appareil ou d'une installation incorrecte.

ENTRETIEN

Effectuer mensuellement des contrôles sur les conditions de l'appareil.

Vérifiez que les points de fixation sont bien serrés et que le câble est en parfait état.

Vérifiez que le boîtier n'est pas endommagé ou bosselé.

Ne faites pas de trous ni d'incisions dans le boîtier, car on pourrait endommager la carte interne et altérer le degré de protection IP.

Si des défauts mécaniques ou électroniques sont détectés, remplacez l'appareil: NE PAS ouvrir l'appareil en aucun cas, car cela pourrait compromettre son efficacité.

NE PAS huiler et/ou graisser l'arbre ou les pièces en rotation.

Assurez-vous de toujours suivre les instructions données dans la documentation fournie avec le produit.

ATTENTION: le non-respect de ces instructions et spécifications techniques met en danger la fonctionnalité et la sécurité du système.

1 INSTRUCCIONES DE USO Y MANTENIMIENTO

(Español - Traducción de las instrucciones originales)

Conformidad a las Normativas Comunitarias: 2014/30/UE, 2014/35/UE, 2006/42/CE

Conformidad a las Normas CE: EN 60204-1, EN60947-1, EN 60947-5-1, EN 60529, EN 61326-1

Conforme al Reglamento para la prevención de accidentes BGV C 1 (sólo para Alemania)

Marcado:   (pending)

Temperatura de funcionamiento: -25°C +80°C

Grado de protección: IP65 / IP67

ATENCIÓN

No utilice el aparato en ambientes con atmósfera potencialmente explosiva o en presencia de agentes corrosivos. Adecuado para su uso en presencia de niebla salina según las normas (IEC 60068-2-11 y STD UL 50E), según la versión. El contacto con aceites, ácidos y disolventes puede dañar el aparato.

La instalación, el uso y el mantenimiento deben ser realizados por personal calificado.

El cableado debe realizarse de acuerdo con las instrucciones.

Antes de efectuar la instalación y el mantenimiento del aparato es necesario desconectar la alimentación principal.

Cualquier modificación de los componentes del aparato anula la validez de los datos de la tarjeta y la identificación del aparato y deja anulados los términos de la garantía.

En caso de sustituir algún componente, utilizar exclusivamente recambios originales.

TER no se responsabiliza de los daños derivados del uso indebido del aparato ó de una instalación incorrecta.

MANTENIMIENTO

Es necesario verificar el estado del aparato mensualmente.

Compruebe que los puntos de fijación estén bien apretados y que el cable esté en perfectas condiciones.

Compruebe que la caja no esté dañada o abollada.

No haga agujeros o incisiones en la caja porque se podría dañar la tarjeta interna y alterar el grado de protección IP.

Al detectar defectos mecánicos o electrónicos, sustituye el aparato: NO abra el aparato bajo ninguna circunstancia, ya que esto podría comprometer su eficiencia.

NO aceite ni engrase el eje y las piezas giratorias.

Asegúrese de seguir siempre las instrucciones en la documentación suministrada con el producto.

ATENCIÓN: al no cumplir con las instrucciones y las especificaciones técnicas se compromete la funcionalidad y la seguridad del sistema.

1 BETRIEBS- UND WARTUNGSANWEISUNG

(Deutsch - Übersetzung der Originalanweisungen)

Einhaltung der Gemeinschaftsrichtlinien: 2014/30/UE, 2014/35/UE, 2006/42/CE

Einhaltung der CE Normen: EN 60204-1, EN60947-1, EN 60947-5-1, EN 60529, EN 61326-1

Konform mit der Unfallverhütungsverordnung BGV C 1 (nur für Deutschland)

Kennzeichnung:   (pending)

Betriebstemperatur: -25°C +80°C

Schutzart: IP65 / IP67

ACHTUNG

Verwenden Sie das Gerät nicht in Umgebungen mit explosionsgefährdeten Bereichen oder in Gegenwart von korrosiven Stoffen. Geeignet für den Einsatz in Salznebelumgebungen gemäß den Normen (IEC 60068-2-11 und STD UL 50E), je nach Ausführung. Die Berührung mit Ölen, Säuren und Lösungsmitteln kann das Gerät beschädigen.

Installation, Verwendung und Wartung nur von Fachpersonal durchgeführt werden.

Anschlüsse müssen gemäß den Anweisungen hergestellt werden.

Vor dem Einbau und der Wartung des Geräts ist es erforderlich, trennen Sie die Stromversorgung.

Jegliche Änderung der Bestandteile des Geräts, annulliert die Gültigkeit des auf dem Gerät angelegten Datenetikettes, als auch die Garantie.

Falls irgendein Bestandteil zu ersetzen ist, dürfen nur Originalersatzteile montiert werden.

TER lehnt jegliche Verpflichtung zum Schadenersatz als Folge von Mißbrauch des Gerätes oder als Folge einer falschen Montage ab.

WARTUNGSANWEISUNG

Der Zustand des Geräts muss monatlich überprüft werden.

Überprüfen Sie, dass die Befestigungspunkte fest sitzen und das Kabel in einwandfreiem Zustand ist.

Stellen Sie sicher, dass das Gehäuse nicht beschädigt oder eingebeult ist.

Machen Sie keine Löcher oder Einschnitte in das Gehäuse, da diese die interne Karte beschädigen und den IP-Schutzgrad verändern können.

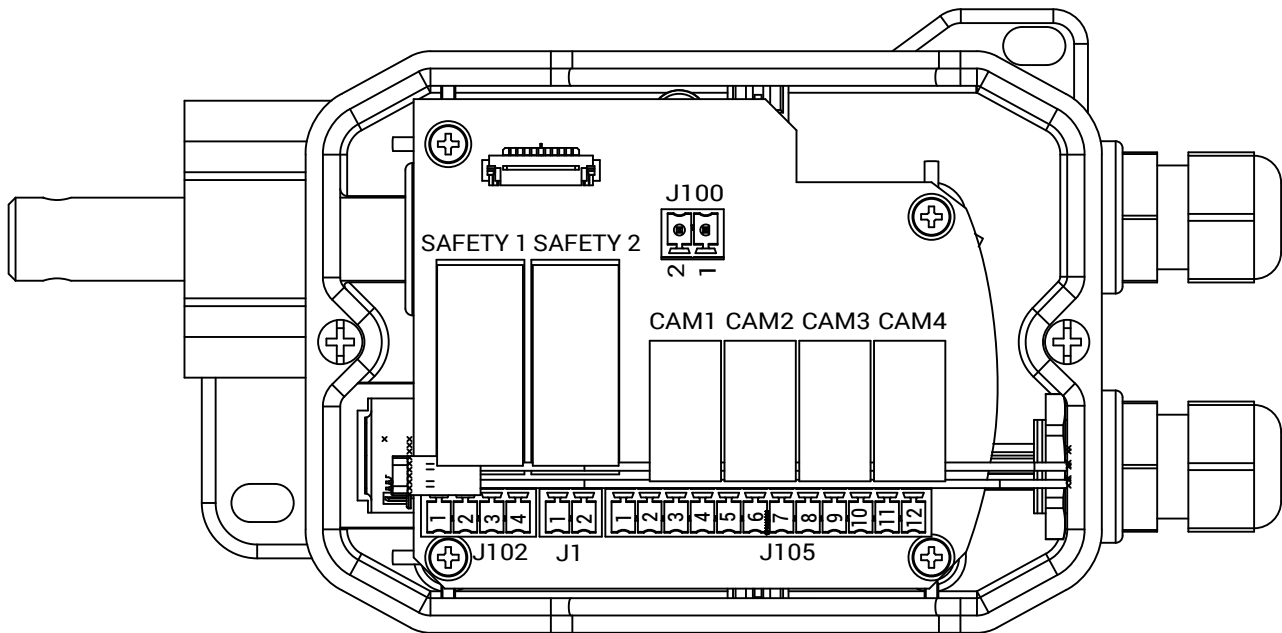
Wenn mechanische oder elektronische Defekte entdeckt werden, tauschen Sie das Gerät aus: öffnen Sie das Gerät NICHT, da dies seine Effizienz beeinträchtigen kann.

NICHT die Welle oder rotierende Teile einölen und/oder fetten.

Stellen Sie sicher, dass Sie immer die Anweisungen in der mit dem Produkt gelieferten Dokumentation befolgen.

ACHTUNG: die Nichtbeachtung dieser Anweisungen und technischen Spezifikationen beeinträchtigt Funktionalität und Sicherheit des Systems.

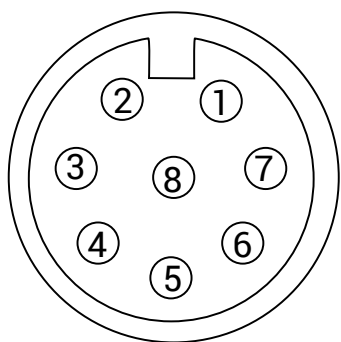
2 SCHEMA DI COLLEGAMENTO - WIRING DIAGRAM - SCHÉMA DE CÂBLAGE - DIAGRAMA DE CABLEADO - SCHALTPLAN



| Connector | PIN | Contacts | Relays |
|-----------|-----|----------|----------|
| J105 | 1 | NO | CAM1 |
| J105 | 2 | COM | CAM1 |
| J105 | 3 | NC | CAM1 |
| J105 | 4 | NO | CAM2 |
| J105 | 5 | COM | CAM2 |
| J105 | 6 | NC | CAM2 |
| J105 | 7 | NO | CAM3 |
| J105 | 8 | COM | CAM3 |
| J105 | 9 | NC | CAM3 |
| J105 | 10 | NO | CAM4 |
| J105 | 11 | COM | CAM4 |
| J105 | 12 | NC | CAM4 |
| J102 | 1 | COM | SAFETY 1 |
| J102 | 2 | NO | SAFETY 1 |
| J102 | 3 | COM | SAFETY 2 |
| J102 | 4 | NO | SAFETY 2 |
| J1 | 1 | NC | SAFETY 1 |
| J1 | 2 | NC | SAFETY 2 |

| Connector | PIN | Description |
|-----------|-----|-------------------|
| J100 | 1 | Power supply 24 V |
| J100 | 2 | GND |

3 ASSEGNAZIONE DEL CONNETTORE MASCHIO - MALE CONNECTOR ASSIGNMENT - ALLOCATION DU CONNECTEUR MÂLE - ASIGNACIÓN DEL CONECTOR MACHO - ZUWEISUNG DES STECKVERBINDERS-STECKER

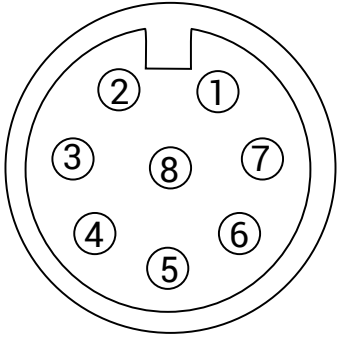


Connettore maschio: Amphenol LTWM 12P-08PMMS-SC (vista frontale)
 Male connector: Amphenol LTWM 12P-08PMMS-SC (front view)
 Connecteur mâle: Amphenol LTWM 12P-08PMMS-SC (vue de face)
 Conector macho: Amphenol LTWM 12P-08PMMS-SC (vista frontal)
 Steckverbinder - Stecker: Amphenol LTWM 12P-08PMMS-SC (Vorderansicht)

| PIN | Segnale | Descrizione |
|-----|--------------|------------------------------|
| 1 | +Vs | Tensione d'alimentazione |
| 2 | CAN-B | Linea di comunicazione CAN - |
| 3 | RS-485-R-TER | Terminazione RS-485 |
| 4 | RS-485 - | Linea di comunicazione 485 - |
| 5 | RS-485 + | Linea di comunicazione 485 + |
| 6 | CAN-R-TER | Terminazione CAN |
| 7 | CAN-A | Linea di comunicazione CAN + |
| 8 | GND | Negativo d'alimentazione |

| Pin | Signal | Description |
|-----|--------------|--------------------------|
| 1 | +Vs | Power |
| 2 | CAN-B | Communication line CAN - |
| 3 | RS-485-R-TER | RS-485 termination |
| 4 | RS-485 - | 485 - Communication line |
| 5 | RS-485 + | 485 + Communication line |
| 6 | CAN-R-TER | CAN termination |
| 7 | CAN-A | Communication line CAN + |
| 8 | GND | Ground |

| PIN | Signal | Description |
|-----|--------------|------------------------------|
| 1 | +Vs | Tension d'alimentation |
| 2 | CAN-B | Ligne de communication CAN - |
| 3 | RS-485-R-TER | Terminaison RS-485 |
| 4 | RS-485 - | Ligne de communication 485 - |
| 5 | RS-485 + | Ligne de communication 485 + |
| 6 | CAN-R-TER | Terminaison CAN |
| 7 | CAN-A | Ligne de communication CAN + |
| 8 | GND | Alimentation négative |



Connettore maschio: Amphenol LTWM 12P-08PMMS-SC (vista frontale)
 Male connector: Amphenol LTWM 12P-08PMMS-SC (front view)
 Connecteur mâle: Amphenol LTWM 12P-08PMMS-SC (vue de face)
 Conector macho: Amphenol LTWM 12P-08PMMS-SC (vista frontal)
 Steckverbinder - Stecker: Amphenol LTWM 12P-08PMMS-SC (Vorderansicht)

| PIN | Señal | Descripción |
|------------|--------------|-----------------------------|
| 1 | +Vs | Tensión de alimentación |
| 2 | CAN-B | Línea de comunicación CAN - |
| 3 | RS-485-R-TER | Terminación RS-485 |
| 4 | RS-485 - | Línea de comunicación 485 - |
| 5 | RS-485 + | Línea de comunicación 485 + |
| 6 | CAN-R-TER | Terminación CAN |
| 7 | CAN-A | Línea de comunicación CAN + |
| 8 | GND | Negativo de alimentación |

| PIN | Signal | Beschreibung |
|------------|---------------|-----------------------------|
| 1 | +Vs | Versorgungsspannung |
| 2 | CAN-B | Kommunikationsleitung CAN - |
| 3 | RS-485-R-TER | Terminierung RS-485 |
| 4 | RS-485 - | Kommunikationsleitung 485 - |
| 5 | RS-485 + | Kommunikationsleitung 485 + |
| 6 | CAN-R-TER | Terminierung CAN |
| 7 | CAN-A | Kommunikationsleitung CAN + |
| 8 | GND | Stromversorgung negativ |

4 MODBUS PROTOCOL SPECIFICATION

4.1 INTRODUCTION

MODBUS is an application layer messaging protocol, positioned on level 7 of the OSI model, which provides client/server communication between devices connected on different types of buses or networks. As an industry standard since 1979, MODBUS continues to enable millions of automation devices to communicate.

MODBUS is a request/reply protocol and offers services specified by function codes, which are elements of request/reply PDUs. The objective of this document is to describe the function codes and Protocol Data Unit (PDU) used within the framework of MODBUS transactions.

For more information see www.modbus.org.

4.2 MODBUS RTU

Atlante Evo supports the communication with Modbus RTU protocol over RS485 bus with a 115200 default baudrate and a default slave ID of 0x18.

Function code 03 is used to read out data, while function code 16 is used to set the parameters.

In a normal data exchange between a master and a slave, Atlante Evo must be considered as a modbus slave as reported in the following figure.

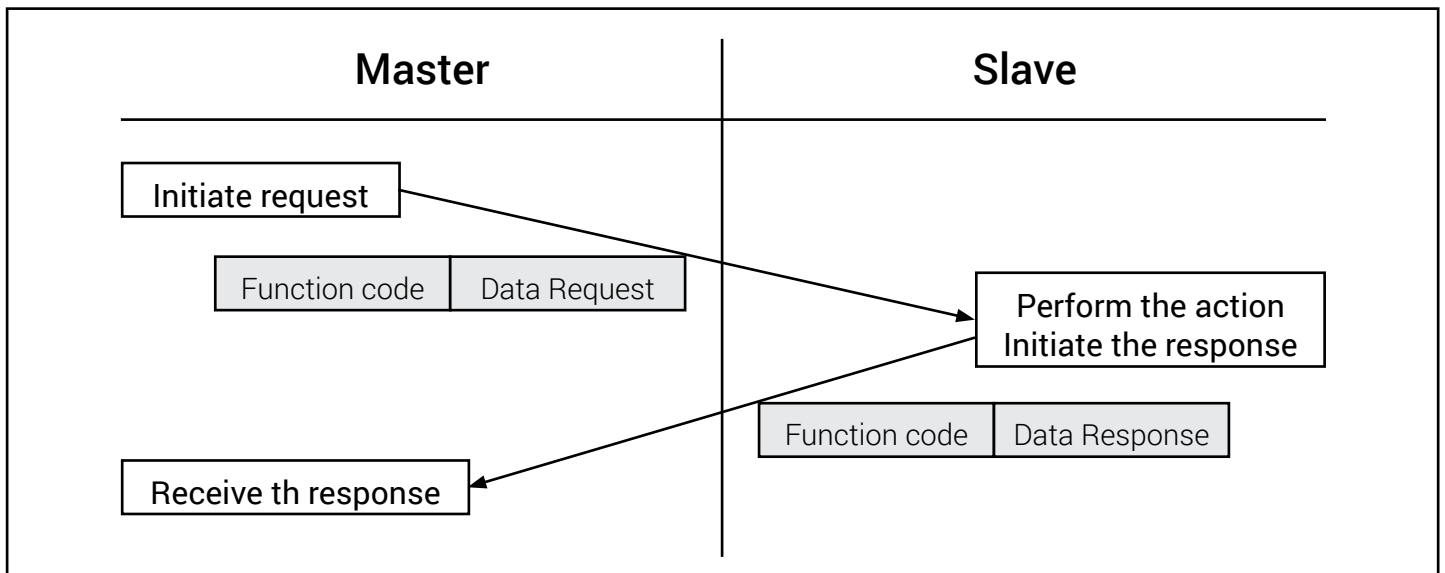


Fig. 1 - Request/Response example

4.2.1 FUNCTION CODE 03 - READ HOLDING REGISTERS

This function code is used to read the contents of a contiguous block of holding registers; the request PDU has to specify the starting register address and the number of registers. Registers are addressed starting at zero, then registers numbered e.g. 1-10 are addressed as 0-9. The register data in the response message are packed as two bytes per register, with the binary contents right justified within each byte. For each register, the first byte contains the high order bits and the second one contains the low order bits.

4.2.2 FUNCTION CODE 16 - WRITE MULTIPLE REGISTERS

This function code is used to write a block of contiguous registers in a remote device. The requested written values are specified in the "request data" field. Data is packed as two bytes per register. The normal response returns the function code, starting address, and quantity of registers written.

4.2.3 MESSAGE STRUCTURE

Frames are transmitted binary to achieve a higher density. The error checksum is represented by a cyclic redundancy check (16 bit CRC; 2 byte) and messages start and end with a silent interval of at least 3.5 character times. This is most easily implemented as a multiple of character times at the baud rate that is being used on the network. The maximum pause that may occur between two bytes is 1.5 character times.

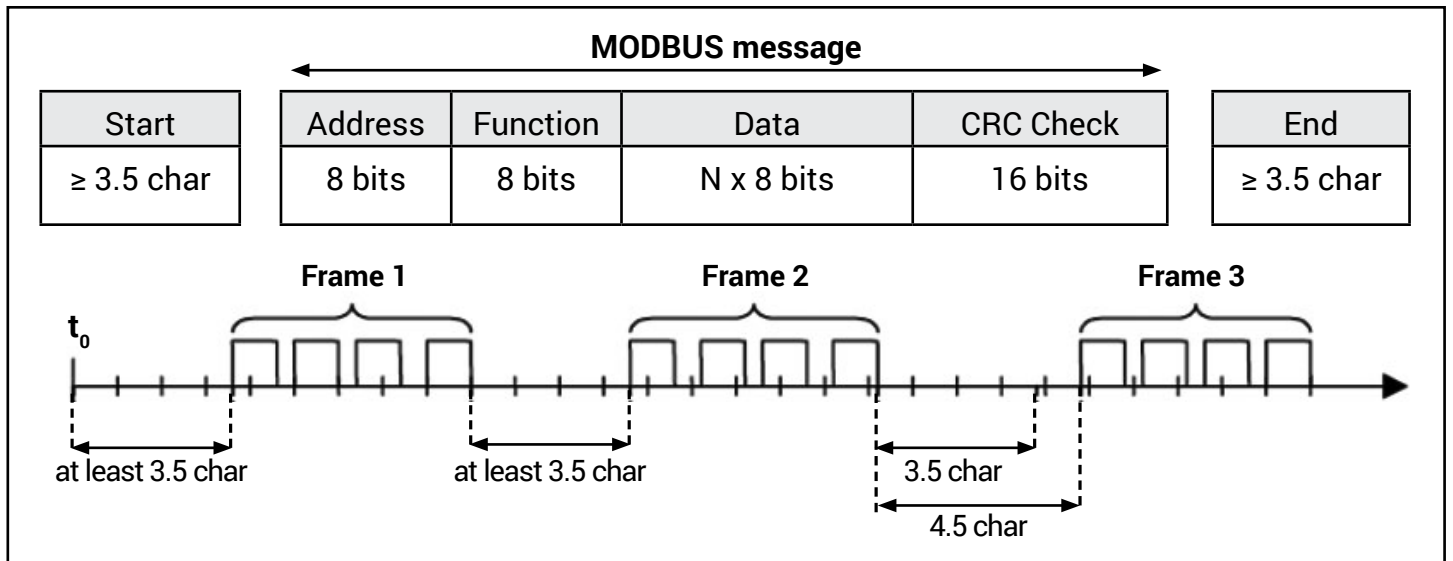


Fig. 2 - PDU structure and timing

4.2.4 MEASURED DATA TRANSMISSION

Atlante Evo is an encoder able to provide three different kinds of output data as reported in the table below.

| Variable | Type | Description |
|-------------------------|-------|--|
| <i>AbsoluteDecAngle</i> | Int32 | expressed in tenth of degrees (e.g. 34567 means that, since the last preset, the sensor axis has been rotated by 3456.7 degrees) |
| <i>NumberOfTurns</i> | Int32 | number of turns since the last preset |

For all above measures, the sign represents the rotation direction.

4.2.5 REGISTERS MAPPING

| Reg | Addr | Data | Func | Type | Format | Notes | R/W |
|-----------------|--------|---------------------|---------|--------|---|---------------------------------|-----|
| Measures | | | | | | | |
| 1 | 0x0000 | AbsoluteDecAngle | F03 | Int32 | Bit 16-31 | - | R |
| 2 | 0x0001 | AbsoluteDecAngle | F03 | | Bit 00-15 | - | R |
| 3 | 0x0002 | NumberOfTurns (MSW) | F03 | Int32 | Bit 16-31 | - | R |
| 4 | 0x0003 | NumberOfTurns (LSW) | F03 | | Bit 00-15 | - | R |
| ... | ... | ... | ... | ... | ... | ... | ... |
| 30 | 0x001D | Battery Status | F03 | Uint16 | Bit 00-15 | 0: ALARM 1: WARNING 2: OK | R |
| ... | ... | ... | ... | ... | ... | ... | ... |
| 39 | 0x0026 | Cam Index | F03/F16 | Uint16 | Bit 00-15 | Range : [0÷5] | R/W |
| 40 | 0x0027 | Cam position index | F03/F16 | Uint16 | Bit 00-15 | Range : [0÷4] | R/W |
| 41 | 0x0028 | Cam Position state | F03 | Uint16 | Bit 00-15 | 1: ON /0: OFF | R |
| 42 | 0x0029 | Reserved | ... | ... | ... | ... | ... |
| 43 | 0x002A | Reserved | ... | ... | ... | ... | ... |
| 44 | 0x002B | Reserved | ... | ... | ... | ... | ... |
| 45 | 0x002C | Cam ON angle (MSW) | F03/F16 | Uint16 | Bit 16-31 | | R/W |
| 46 | 0x002D | Cam ON angle (LSW) | F03/F16 | Uint16 | Bit 00-15 | | R/W |
| 47 | 0x002E | Cam OFF angle (MSW) | F03/F16 | Uint16 | Bit 16-31 | | R/W |
| 48 | 0x002F | Cam OFF angle (LSW) | F03/F16 | Uint16 | Bit 00-15 | | R/W |
| 49 | 0x0030 | Command | F16 | Uint16 | - 0x0100: to save cams config - 0x02xy: to clear cam config, where "xy" represents the cam index (in the range 0÷5) - 0x0600: to reset position | | W |

4.2.6 COMMUNICATION EXAMPLES

4.2.6.1 Read multiple Holding Registers

Following is an example of reading several holding registers, from register 0x0000 to 0x0003 for the SlaveID 0x18.

In the example:

- AbsoluteDecAngle = 5982 (598.2°)
- NumberOfTurns = 1 revolutions

| Byte | Request | Byte | Answer |
|--------------|--|--------------|---|
| <i>(Hex)</i> | <i>Field name</i> | <i>(Hex)</i> | <i>Field name</i> |
| 18 | Device address | 18 | Device address |
| 03 | Function code | 03 | Function code |
| 00 | Address of the first register Hi bytes | 08 | The number of data bytes to follow (4 registers x 2 bytes each = 8 bytes) |
| 00 | Address of the first register Lo bytes | 00 | AbsoluteDecAngle (MSB) [3] |
| 00 | Number of registers Hi bytes | 00 | AbsoluteDecAngle[2] |
| 04 | Number of registers Lo bytes | 17 | AbsoluteDecAngle[1] |
| 46 | MSB of Checksum CRC-16 | 5E | AbsoluteDecAngle (LSB) [0] |
| 00 | LSB of Checksum CRC-16 | 00 | NumberOfTurns (MSB)[3] |
| | | 00 | NumberOfTurns [2] |
| | | 00 | NumberOfTurns [1] |
| | | 01 | NumberOfTurns LSB[0] |
| | | C9 | MSB of Checksum CRC-16 |
| | | 66 | LSB of Checksum CRC-16 |

4.2.6.2 Write Holding Register

Here is reported an example of writing a holding register with address 0x0030 for the SlaveID 0x18.

| Byte | Request | Byte | Answer |
|--------------|--|--------------|--|
| <i>(Hex)</i> | <i>Field name</i> | <i>(Hex)</i> | <i>Field name</i> |
| 18 | Device address | 18 | Device address |
| 10 | Function code | 10 | Function code |
| 00 | Address of the first register Hi bytes | 00 | Address of the first register Hi bytes |
| 30 | Address of the first register Lo bytes | 30 | Address of the first register Lo bytes |
| 00 | Number of registers Hi bytes | 00 | number of registers written Hi bytes |
| 01 | Number of registers Lo bytes | 01 | number of registers written Lo bytes |
| 02 | Number of byte to follow | 03 | MSB of Checksum CRC-16 |
| 05 | value to write : MSB of reset command | CF | LSB of Checksum CRC-16 |
| 00 | value to write : LSB of reset command | | |
| 07 | MSB of Checksum CRC-16 | | |
| 60 | LSB of Checksum CRC-16 | | |

4.3 CAM CONFIGURATION

Atlante Evo can be configured to activate one or more cam position (up to 5 for each cam) when a certain axis position (expressed in tenths of angle) is reached. Following is a brief set up example, a sequence of steps where the first cam (index zero) is configured to be active after 3 turns and 140° and to go idle after 5 turns. All positions have to be referred to the zero position (see specific modbus command).

1. Move the axis to the zero position
2. Write the value 0x0600 to the register 0x002F
3. Read and concatenate register number 1 and 2 to have the sensor position. You will see a zero value.
4. Write the value 0x0000 to the register 0x0026 to select the first cam
5. Write the value 0x0000 to the register 0x0027 to select the first cam position
6. Write the value 0x2FA8 ⁽¹⁾ to the register 0x002C to set the ON angular position
7. Write the value 0x4650 ⁽²⁾ to the register 0x002E to set the OFF angular position
8. Write the value 0x0100 to the register 0x002F to save the set up



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