Emerson EPRO Series Service Manual

A6500-UM

1. Description

Emerson A6500-UM Universal

3. Product Information

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Emerson A6500-UM Universal
Measurement Card
The A6500-UM Universal Measurement Card is a component of the AMS 6500 ATG machinery protection system. The card is equipped with 2 sensor input channels (independent or combined, as per chosen measurement mode) working with most common sensors as eddy-current, piezoelectric (accelerometer or velometer), seismic (electro dynamic), LF (low frequency bearing vibration), Hall-effect and LVDT (in combination with A6500-LC) and dynamic pressure sensors. Besides this, the card contains 5 digital inputs and 6 digital outputs. The measured signals are transmitted through the internal RS 485 bus to the A6500-CC Com Card and converted to Modbus RTU and Modbus TCP/IP protocols for further transmission to host computers or analysis systems. In addition, the Com Card provides the communication through the USB socket at the face plate for the connection to PC/ laptop for the configuration of cards and for visualization of measuring results. Apart from that, the measuring results can be output through analog outputs 0/4 - 20 mA. These outputs have a common ground and are electrically isolated from system supply. The operation of the A6500-UM Universal Measurement Card is performed in the A6500-xR System Rack, which also provides connection of supply voltages and signals. The A6500-UM Universal Measurement Card provides the following functions:
 Shaft Vibration
z Displacement (0-Peak, Peak-Peak, RMS, Smax, SmaxPP)
 Case Vibration
z Displacement (0-Peak, Peak-Peak, RMS, Smax, SmaxPP)
z Velocity (0-Peak, Peak-Peak, RMS, Smax, SmaxPP)
z Acceleration (0-Peak, Peak-Peak, RMS, Smax, SmaxPP)
 Position
z Distance (Single, Tandem, Cone)
z Rod gap
z Rod drop (Average, Triggered)
z Eccentricity (Peak-Peak, Min, Max)
 Speed and Key
 Pressure
z Dynamic (0-Peak, Peak-Peak, RMS)
Two-channel, 3U size, 1-slot plug-in
module decreases cabinet
space requirements in half from
traditional four-channel 6U size cards.
 API 670 compliant,
hot swappable module.
 Remote selectable limit multiply
and trip bypass.
 Front and rear buffered and
proportional outputs,
0/4 – 20mA output.
 Self-checking facilities include
monitoring hardware, power input,
hardware temperature, sensor,
and cable.
Signal Input, Eddy current
Input Signal and
Raw Signal Voltage Range
-1 V to -22 V
Frequency Range 0 to 18750 Hz attenuation <0.1 db
Supply Voltage -23.25 V / -26.0 V DC selectable short
circuit proof
Maximum Supply Load 35 mA
Supply Accuracy ±1%
Supply Load Variation ±1% for loads 0 to 100%

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Supply Temperature Drift ±1% within operating
temperature range
of -20°C to +70°C
Signal Input, Piezoelectric
Input Signal and
Raw Signal Voltage Range
+1 V to +23 V
Frequency Range 0 to 18750 Hz attenuation <0.1 db
Supply Constant Current 0 to 8 mA adjustable selectable
as 2-wire or
4-wire connection
Supply Gain Accuracy ±3.5%
Supply Offset Accuracy +100 µA / -0 µA
Supply Voltage Reserve + 25 V
Supply Temperature Drift ±50 µA within operating
temperature range
of -20°C to +70°C
Signal Input, Seismic (electro dynamic)
Input Signal and
Raw Signal Voltage Range
-10 V to +15 V
Frequency Range 0 to 2000 Hz attenuation <0.1 db
Supply Lifting Current 0 to 8 mA adjustable selectable
as 2-wire or
4-wire connection
Supply Gain Accuracy ±3.5%
Supply Offset Accuracy +100 µA / -0 µA
Supply Voltage Reserve + 12 V
Supply Temperature Drift ±50 µA within operating
temperature range
of -20°C to +70°C
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A6500-UM
Signal Input, LF (low frequency bearing vibration)
Input Signal and
Raw Signal Voltage Range
-11 V to +11 V
Frequency Range 0 to 1000 Hz attenuation <0.1 db
Supply Voltage ±15 V DC short circuit proof
Maximum Supply Load 35 mA
Supply Accuracy -5%
Supply Load Variation -12% for loads 0 to 100%
Supply Temperature Drift ±3% within operating
temperature range
of -20°C to +70°C
Signal Input, Hall-effect / A6500-LC
Input Signal and
Raw Signal Voltage Range
+1 V to +22 V
Extended Input Range 0 V to +30 V only valid for
speed measurement,
sensor raw signal will clip
Frequency Range 0 to 18750 Hz attenuation <0.1 db
Supply Voltage +30 V short circuit proof
Maximum Supply Load 35 mA
Supply Accuracy -10%
Supply Load Variation -12% for loads 0 to 100%
Supply Temperature Drift ±3% within operating
temperature range
of -20°C to +70°C

Signal Input, VR Sensors
Input signal range and raw
signal voltage range
-22 V to +22 V Clipping limit range for
the sensor raw signal
-15 V to +15 V
Maximum sensor
input range
-30 V to +30V Sensors with higher
nominal voltages must
be connected through a
Zener barrier to protect
the input
Frequency range 0 to 18750 Hz Attenuation < 0.1 dB
Sensor impedance 110 Ω to 10 Ω Sensor health detection
may be reduced if the
sensor is out of this range
A6500-UM
Digital Input
Number of Inputs 5
Logic Low Level 0 V to 3 V active
Logic High Level 13 V to 32 V, open not active
Load <1 mA
Rated Current 1 mA
Rated Power 24 mW for loads 0 to 100%
Inputs for Key-Signals 2 two of the five inputs can
be used for key-signal
inputs, either DI 1 or DI 2
Key-Signal
Frequency Range
0 to 2000 Hz at duty cycle 20 to 80%
Current Output
Number of Outputs 2
Range 0/4 to 20 mA
Accuracy ±1% of full scale
Maximum Load <500 Ω
Rated Voltage 10 V
Rated Power 0.2 W
Temperature Drift ±1% of full scale within operating
temperature range
of -20°C to +70°C
Digital Output
Number of Outputs 6 solid state relay
Type normally open equivalent to SPST
protected against
polarity reversal
Voltage Capability 19 V to 32 V DC
Maximum Load 100 mA
Rated Current 100 mA
Rated Power 2.4 W
Turn-On / Turn-Off Time <5 ms At 20 kΩ load (without
alarm detection time
as configured delays,
filter settings, and so on)
A6500-UM
Pulse Output
Number of Outputs 2
Type normally open Opto-decoupled
collector-emitter output

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Protected against
polarity reversal
Voltage Capability 19 V to 32 V DC
Maximum Load 30 mA
Frequency Range 0 to 2000 Hz at 50% duty cycle
Additional
Pull-Up Voltage
19 V to 32 V DC Short circuit proof
Fan-Out 21 Key-signal inputs of
A6500-UM at pull-up
voltage of 24 V DC
Raw Signal Output
One Output per Sensor Input, Nonreactive and Short Circuit Proof
Voltage according to sensor signal
Rated Current 2 mA
Rated Power 60 mW
Accuracy ±1% of full scale For connected devices
with input impedance >
100 kΩ
Phase Shift <5° frequencies up to 2000 Hz
<15° frequencies up to 18750
Hz
Key-signal inputs of
A6500-UM at pull-up
voltage of 24 V DC
Temperature Drift ±1% of full scale within operating
temperature range
of -20°C to +70°C
Frequency Range 0 to 18750 Hz attenuation <1 db
A6500-UM
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Environmental, General
Protection Class IP20, IEC 60529
Conformal Coating Airborne
contaminants
resistance
ISA-S71.04-1985
airborne
contaminants
class G3
Material:
HumiSeal® 1B31
EPA
According to
IPC-CC-830B
and IPC-A 610
Operating Temperature -20° to 70°C (-4° to 158°F)
with forced cooling
-20° to 55°C (-4° to 131°F)
without forced cooling
Storage Temperature -40°C to +85°C (-40°F to 185°F)
Relative Humidity 5 to 95%, non-condensing
Vibration IEC 60068-2-6 0.15mm,
10 – 55Hz 20m/s²,
55 – 150Hz
Shock 150 m/s2 4000 shocks per axis
EMR Resistance EN50081-1 / EN50082-2
Power Consumption Max. 6W
Configuration Password protected
Rack Slot 3RU/6HP

Board Dimensions PCB/EURO card format according
to DIN 41494, 100 x 160mm
(3.937 x 6.300in)
Weight app 200g exclusive packaging
A6500-UM
Compliance and Certifications
CE EMC – EN61326-1
2014/30/EU
2014/34/EU
2011/65/EU
ATEX EN 60079-0:2012
EN 60079-15:2010
IEC-Ex
CCOE PESO India
IEC 60079-0:2011; Edition: 6.0
IEC 60079-15:2010; Edition: 4
CSA CAN/CSA-C22.2 NO. 0-10
CAN/CSA-C22.2 NO. 61010-1-12
CAN/CSA-C22.2 NO. 60079-0:15
CAN/CSA-C22.2 NO. 60079-15:12
IEC 60529:2013 + COR2:2015
UL 61010-1:12
UL 60079-0:13
UL 60079-15:13
EAC TP TC 012/2011
ГОСТ 31610.0-2014
ГОСТ 31610.15-2014
CCC GB 3836.1-2010
GB 3836.8-2014
Marine DNV GL rules for classification –
Ships and offshore units
Safety (SIL):
SC 2 (SIL 2 Capable)
IEC 61508:2010 Parts 1-7
Hazardous Area Approvals
Non-sparking nA in combination with nC
ATEX II 3G – Ex nA nC IIC Gc, -20°C ≤ Ts ≤ 70°C
(with Ts ≤ 70°C the requirements
for temperature class T4 are met)
IEC-Ex II 3G – Ex nA nC IIC Gc, -20°C ≤ Ts ≤ 70°C
(with Ts ≤ 70°C the requirements for
temperature class T4 are met)
CSA Class I Division 2, Groups A, B, C, D, T4
Class 1, Zone 2
Ex / AEx nA nC IIC T4 Gc
(the ambient temperature within the end
use enclosure shall not exceed 55°C)
EAC-Ex Ex nA nC IIC Gc,U -20°C ≤ Ts ≤ 70°C
CCC-Ex Ex nA nC IIC Gc -20°C ≤ Ts ≤ 70°C
CCOE PESO India Ex nA nC IIC T4 Gc, -20°C ≤ Ts ≤ 70°C
(with Ts ≤ 70°C the requirements
for temperature class T4 are met)
KTL Korea Ex nA nC IIC -20°C ≤ Ts ≤ 70°C
Ordering Information
Model Number Product Description
A6500-UM A6500-UM - UNIVERSAL
MEASUREMENT CARD

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