Remote Panel
User Guide
Installation and Operating Instructions

Declaration
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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation, or adjustment of the internal operating parameters of the drive or from mismatching of the drive to the motor.
The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the User Guide without notice.

Model No. ECS100L
Manual Part No. 82-REM-PAN-ABB_V2
Document Part No. MN448
Literature Fulfillment number. MN448

Safety Notices
WARNING is given where there is a hazard that could lead to injury or death of personnel.
CAUTION is given where there is a hazard that could lead to damage to equipment.

Safety
The REMOTE PANEL is designed to be used in conjunction with the EC Titanium™ variable speed drive. It is intended for professional incorporation into control systems. The EC Titanium must be installed correctly to prevent a safety hazard. The EC Titanium uses high voltages and currents, which is attended to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction.

System design, installation, commissioning and maintenance must be carried out only by personnel who have the necessary training and experience. They must read carefully this safety information and the instructions in this User Guide and follow all information regarding transport, storage, installation and use, including the specified environmental limitations.

Please read the IMPORTANT SAFETY INFORMATION below, and all Warning and Caution boxes elsewhere.

Important Safety Information
Safety of machinery, and safety-critical applications
The level of integrity offered by the REMOTE PANEL/EC Titanium control functions – for example stop/start, forward/reverse and maximum speed, is not sufficient for use in safety-critical applications without independent means of protection. All applications where malfunction could cause injury or loss of life must be subject to a risk assessment and further protection provided where needed.

Within the European Union, all machinery in which this product is used must comply with Directive 89/392/EEC, Safety of Machinery. In particular, the electrical equipment should comply with

Conformity with Standards for EC Titanium
• CE-marked for Low Voltage Directive.
• EN61000-4 4 EMC Generic Emissions, Industrial Level.
• EN61000-2-2 EMC Generic Immunity Standard, Industrial Level.
• Enclosure ingress protection, EN60529, NEMA 250.
• Flammability rating according to UL 94.

General Specification
Compatible Drives: EC Titanium
Supply Input: 10V … 36V DC, 30mA
RS485 signal: industry standard 2 -wire +5V differential
Environmental: Operational 0 … 50 °C
                   Storage -40 °C … 60 °C
Relative Humidity < 95% (noncondensing)
Protection rating: IP54
Max cable length: 20m (unscreened, total length) 100m (screened, twisted pair, total length)

Electrical Interface
The REMOTE PANEL uses a standard RJ45 6-Way connector as its electrical interface, which provides a simple solution for the user to set up their system using a standard RJ45 6-Way data cable. The signal layout of the connector is as follows:

Electrical Installation
The panel must be mounted with floating panel onto the wall.
The panel should be cut out in accordance with the diagram below.
The panel on to which the REMOTE PANEL is to be mounted should be cut out in accordance with the diagram below.

Cable Requirements
If the data cable is made up on site, ensure that the connection pin out is correct: Pin 1 to Pin 1, Pin 6 to Pin 6 etc.

CAUTION: Incorrect cable connection may damage the drive.
Extra care should be taken when using third party cable.

CAUTION: When inspecting the REMOTE PANEL before installation to ensure it is undamaged.
Store the REMOTE PANEL in its box until required.
Storage should be clean and dry. Temperature range -40°C to +60°C.

System Set-up
Depending on the requirement of the application, the REMOTE PANEL can be used in the following four different ways:
(1) Remote Panel & (1) or (2) Remote Panels & up to (63) EC Titanium
(2) Remote Panels & (1) or (2) EC Titanium

Electromagnetic Compatibility (EMC)
The EC Titanium is designed to high standards of EMC. EMC data is provided in the EC Titanium Data Sheet, available on request. Under extreme conditions, the product might cause or suffer disturbance due to electromagnetic interaction with other equipment. It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 89/336/EEC, Electromagnetic Compatibility.

When installed as recommended in this User Guide, the radiated emissions levels of all EC Titanium’s are less than those defined in the Generic radiated emissions standards EN61000-6-4. The conducted emission levels are less than those defined in the Generic radiated emissions standard EN61000-6-4 (class A) for the specified motor cable lengths.

User Interface

Warning:
Bi-directional keypad mode is enabled (See drive user guide).
The direction of rotation if the button is used to start a tripped drive. In normal keypad mode, this button is used to decrease parameter values in parameter edit mode.

Extra care should be taken when using third party cable.

CAUTION: When in keypad mode, the button is used to start a tripped drive. In normal keypad mode, this button is used to decrease parameter values in parameter edit mode.

System Setup
The EC Titanium provides the power supply to the REMOTE PANEL via the RJ45 connection. Once the physical connection has been set up, the system is ready to operate. See picture blow:

Different drive models can be used on the same Remote Panel network providing a unique communication address is assigned to each. The Remote Panel uses a standard RJ45 6-Way connector as its electrical interface. A standard RJ45 Splitter can be used between the Keypad and multiple drives.
Easy Start Up
To setup the communication address
On first power up, the REMOTE PANEL will communicate with network drive address 1 and if the drive is being controlled by the REMOTE PANEL is searching for a drive with network address 1.

“Load...” is displayed indicating the keypad is reading configuration information from the drive. After 1-2 seconds, data has been loaded and the REMOTE PANEL will display real time drive status.

If the display shows “Add” it means the keypad didn’t find a drive with address 1 in the network. Use the UP and DOWN buttons to select and change the correct address from 1 to 63. Once the address has been changed to a correct value, press STOP to initiate search again.

Connection to a network of multiple drives
Selection of the drive address can be changed at any time. Press STOP and DOWN buttons together and message “Addr-XX” is displayed. Use UP or DOWN buttons to select the desired drive address. Select the drive address and press STOP and DOWN button together to establish communications with the new drive address.

To set up the REMOTE PANEL device number
A maximum of (2) REMOTE PANELs can be used on the same drive network. To use (2) keypads on one drive, change the Device Number on the second panel from the default value of 1 for correct drive network. To use (2) keypads on one drive, change the Device Number to 2 or 3.

NOTE: An REMOTE PANEL with Device Number 1 must always be present for the network to function correctly. Change the Device Address to 0 in the event if one of the multiple keypads are disconnected.

Real Time Operation
Once the communication has been established between the EC Titanium™ and REMOTE PANEL, the user can control the EC Titanium™ by using the control buttons on the front panel of the REMOTE PANEL.

To vary the speed in real time keypad control mode
Note: A Run command must also be present at the drive terminals (e.g. Link 11 to 12)

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>START</td>
<td>Drive will ramp up to the preset speed set in the digital potentiometer, (assuming parameter 1100 = 1)</td>
<td></td>
</tr>
<tr>
<td>UP</td>
<td>Press the UP button to increase speed. The drive will run forward, increasing speed until the UP button is released. The maximum speed is the speed set in parameter 2088.</td>
<td></td>
</tr>
<tr>
<td>DOWN</td>
<td>Press DOWN to decrease speed. The drive will decrease speed until the STOP button is released. The minimum speed is the speed set in parameter 2007.</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>Press the STOP to stop the drive. The drive will decelerate to stop at the selected deceleration time. The drive will finally show “STOP” at which point the drive is disabled.</td>
<td></td>
</tr>
<tr>
<td>START</td>
<td>Pressing the START key once more results in the drive running back up to the speed at which it was previously running (assuming 1100 = 1).</td>
<td></td>
</tr>
</tbody>
</table>

Pre-setting target speed in keypad mode
Set parameter 1100 = 1 or 3 enables drive start from keypad reference speed. Set Parameter 1100 = 1 for forward direction only and = 3 for forward and reverse operation.

While in stop, press the STOP key and the target speed is displayed (digital potentiometer). Use UP & DOWN keys to select target speed.

Press STOP key to return to real time display “STOP” or the START key to start the drive ramping up to the target speed.

To reverse direction of rotation with Parameter 1103 = 2
Press START key to ramp up to keypad reference speed set above. Press UP or DOWN to increase or decrease speed. Press the START key again. The motor will reverse its direction of rotation.

Press the STOP key to de-cel the motor to standstill.

Whenever the drive is started, it will start with a positive speed unless the direction is negated by the digital inputs on the user terminals.

Keypad Display Monitoring
Prior to operation the keypad with show Stop, pressing the STOP key allows setting the preset speed shown on the display as H.8, R.8, or R.8 and while in operation the following displays can be accessed.

Display Description
- Stop: Drive mains power applied, but No Enable or Run signal applied.
- Hi: Drive running, display shows output frequency (Hz).
- R.8: Drive running, display shows motor current (amps). (digital potentiometer)
- P.0: Drive Running, display shows motor power (kW).
- S.0n/d: F0009: If the enable / disable switch is open the drive will de-cel to stop at stop time the display will show "Stop" if the potentiometer is turned to zero enable / disable closed with display show H 0.0 (0.0Hz), If left like this for 60 seconds the drive will go into standby mode, display shows ‘Blndy’, waiting for a speed reference signal.

To monitor or change a parameter value
- Press and hold NAVIGATE key > 1s when driving is displaying “Stop”, Displays changes to Par S, indicating the short (S) parameter group.
- Use UP or Down Arrow to select the S, L or a parameter number.
- Press NAVIGATE key while group letter is flashing to enter group.
- Use UP or Down to change the desired parameter number.
- To change parameter values, press and hold the navigate key then use the Up and Down Keys to change to the required value.
- Press and release the NAVIGATE key to store the change.
- Press and hold NAVIGATE key > 1s to return to real-time mode. Display shows "Blndy", display shows ‘Blndy’, waiting for a speed reference signal.

Unlocking access to parameters
Select “Long Parameter mode (Par L) as shown in Real Time Operation.
1. Parameter 1603 sets the chosen parameter access code.
2. Press Navigate to exit, 1603 will be hidden and all parameters will be “Read only” (Parameter 1602 remains “Read Write”).
3. Access to parameters by REMOTE PANEL is now prevented.

NOTE: Operation information (e.g. speed, current, power etc) can still be accessed as normal and the drive can still be controlled from the keypad.

Troubleshooting
The REMOTE PANEL uses various display messages to indicate different working status. See the following table for more information.

<table>
<thead>
<tr>
<th>Message</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCAN</td>
<td>The REMOTE PANEL is searching for the drive in the network.</td>
</tr>
<tr>
<td>LOAD</td>
<td>The REMOTE PANEL has found the drive in the network and is loading the initialization information from the drive.</td>
</tr>
<tr>
<td>Em-SC</td>
<td>The REMOTE PANEL hasn’t lost the communication link to the drive.</td>
</tr>
<tr>
<td>Addr-XX</td>
<td>Indicates the REMOTE PANEL address where XX=1, 2</td>
</tr>
</tbody>
</table>

Port-X This message shows the REMOTE PANEL device number X = 1 or 2 |

Basic Drive Trip Codes
For a full list of codes and detailed troubleshooting information please refer to the drives users manual.

<table>
<thead>
<tr>
<th>Message</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>F000</td>
<td>Drive overload trip</td>
</tr>
<tr>
<td>F001</td>
<td>Drive trip</td>
</tr>
<tr>
<td>F002</td>
<td>Hardware Over-current / Internal power stage fault</td>
</tr>
<tr>
<td>F003</td>
<td>Over voltage on DC bus</td>
</tr>
<tr>
<td>F004</td>
<td>Under voltage on DC bus</td>
</tr>
<tr>
<td>F005</td>
<td>Over-temperature</td>
</tr>
<tr>
<td>F006</td>
<td>Under-temperature</td>
</tr>
<tr>
<td>F007</td>
<td>Faulty thermostat on heat sink</td>
</tr>
<tr>
<td>F008</td>
<td>External trip on digital input</td>
</tr>
<tr>
<td>F009</td>
<td>Over-current</td>
</tr>
<tr>
<td>F010</td>
<td>Comm loss trip</td>
</tr>
<tr>
<td>F011</td>
<td>Input phase loss trip</td>
</tr>
<tr>
<td>SP-F</td>
<td>Spin start failed</td>
</tr>
<tr>
<td>F021</td>
<td>Internal memory fault. Parameters not saved, defaults recalled</td>
</tr>
<tr>
<td>F022</td>
<td>Analog input current out of range</td>
</tr>
<tr>
<td>RC-F</td>
<td>Auto-tune failed error with code</td>
</tr>
</tbody>
</table>

Understanding the Display Messages

Reference: ABB Motors and Mechanical Inc.
9065 US-27
Fort Smith, AR  72901
5711 R. S. Boreham Jr. Street
Fort Worth, TX 76126
903-449-1481
Fax: 903-449-4551
Mechanical Power Transmission Support
903-664-2974, 4980
new.abb.com/mechanical-power-transmission